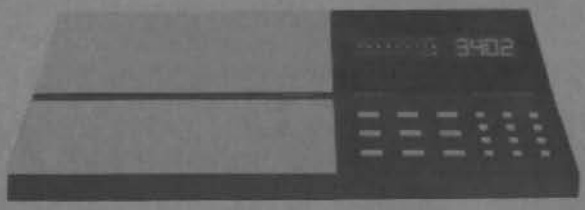
Bang&Olufsen



BEOCORD 6000

Type 4831-4832-4833-4834-4835-4836-4837

BEOCORD 8002

Type 4841-4842-4843-4844-4845-4846-4847

SERVICE MANUAL

1 Microcomputer and display

2 Rec. Dolby NR

3 Play back. Bias

4 Power Supply

5 Power Unit

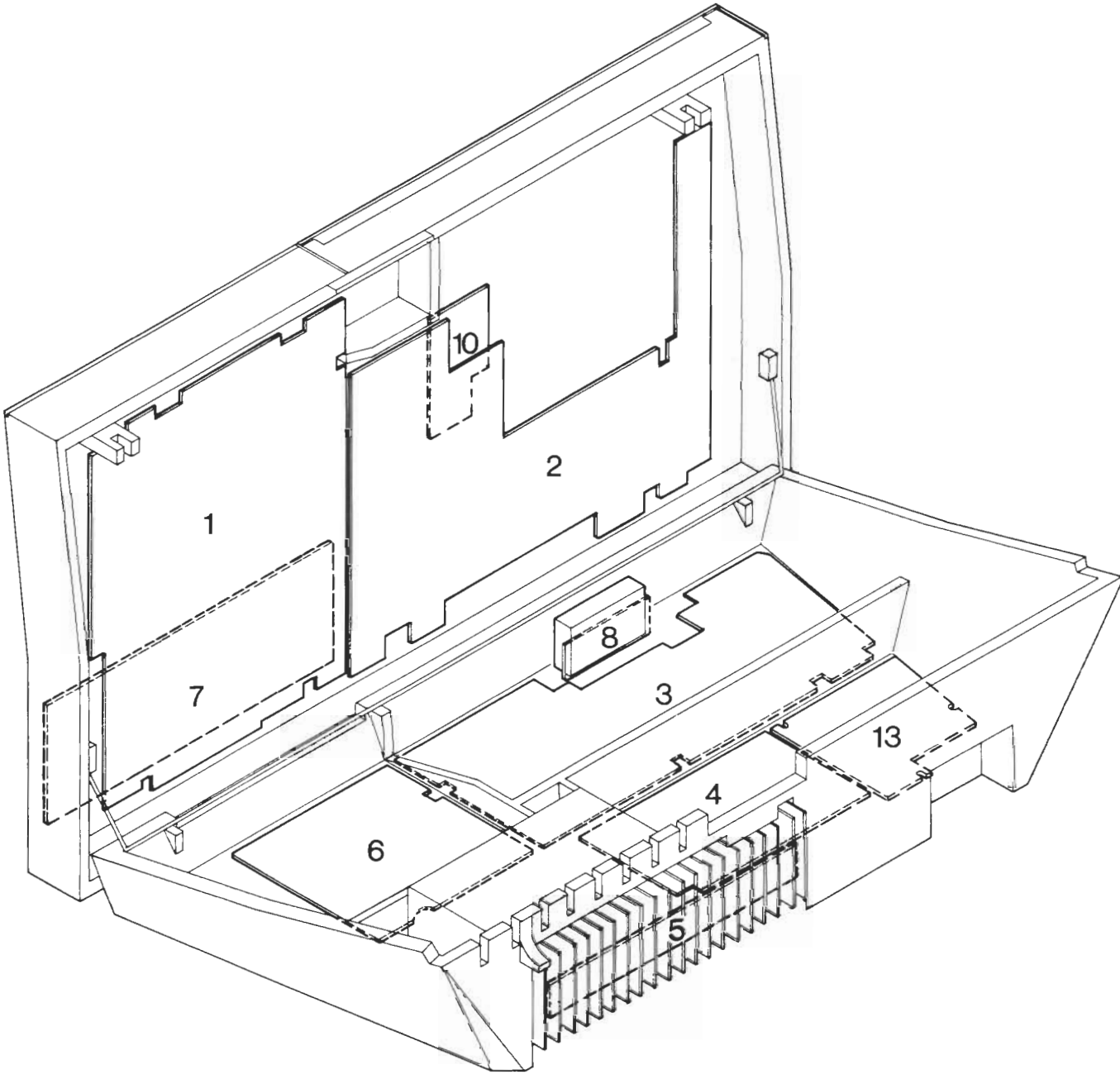
6 Rectifier

7 Operating Unit

8 Mic. and Input Amplifier

10 Clock-set

13 Bias Osc.



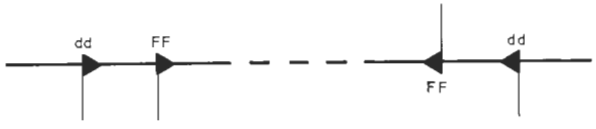
MEASURING CONDITIONS

All DC voltages have been measured in relation to ground with voltmeter with an input resistance of 11 Mohms.
Oscillograms and AC voltages have been measured in relation to ground with oscilloscope or voltmeter with an input resistance of 1 Mohm.
Voltages: Position play back (333 Hz 250 pWb)
AC voltages stated in millivolts (mV). Ex.: 733 mV.
DC voltages stated in volts (V). Ex.: 0.7 V.
The signal path in recording pos. is shown in left channel, and replay pos. is shown in right channel.

EXPLANATION TO DIAGRAM

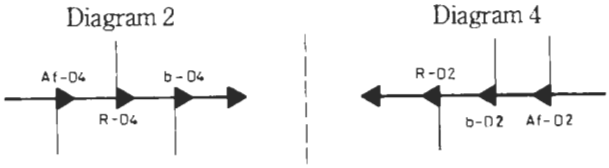
The wire connections have been gathered into »bundles« in the diagram. The individual wire is provided with codes indicating where they lead to.

INTERNAL CONNECTION ON A DIAGRAM PAGE



indicating by two identical letters (capital or small).

CONNECTION TO ANOTHER DIAGRAM PAGE



indicated by a letter (capital or small) and a diagram (D) number or by a small and a capital letter together with a diagram (D) number.

GROUND SYMBOLS

Two different ground symbols are used in the set.

= ground (motors, display, magnet, coils, etc.)

= signal ground

Signal voltages must be measured in relation to signal ground in order to obtain correct result.

CO-ORDINATE NUMBERS

The biggest PC boards are provided with co-ordinate systems. The components on these PC boards are provided with a co-ordinate number on the diagram (smaller printing type than the position numbers) indicating in which co-ordinate they are placed on the PC board.

DIAGRAM 1 FOR BEOCORD 6000

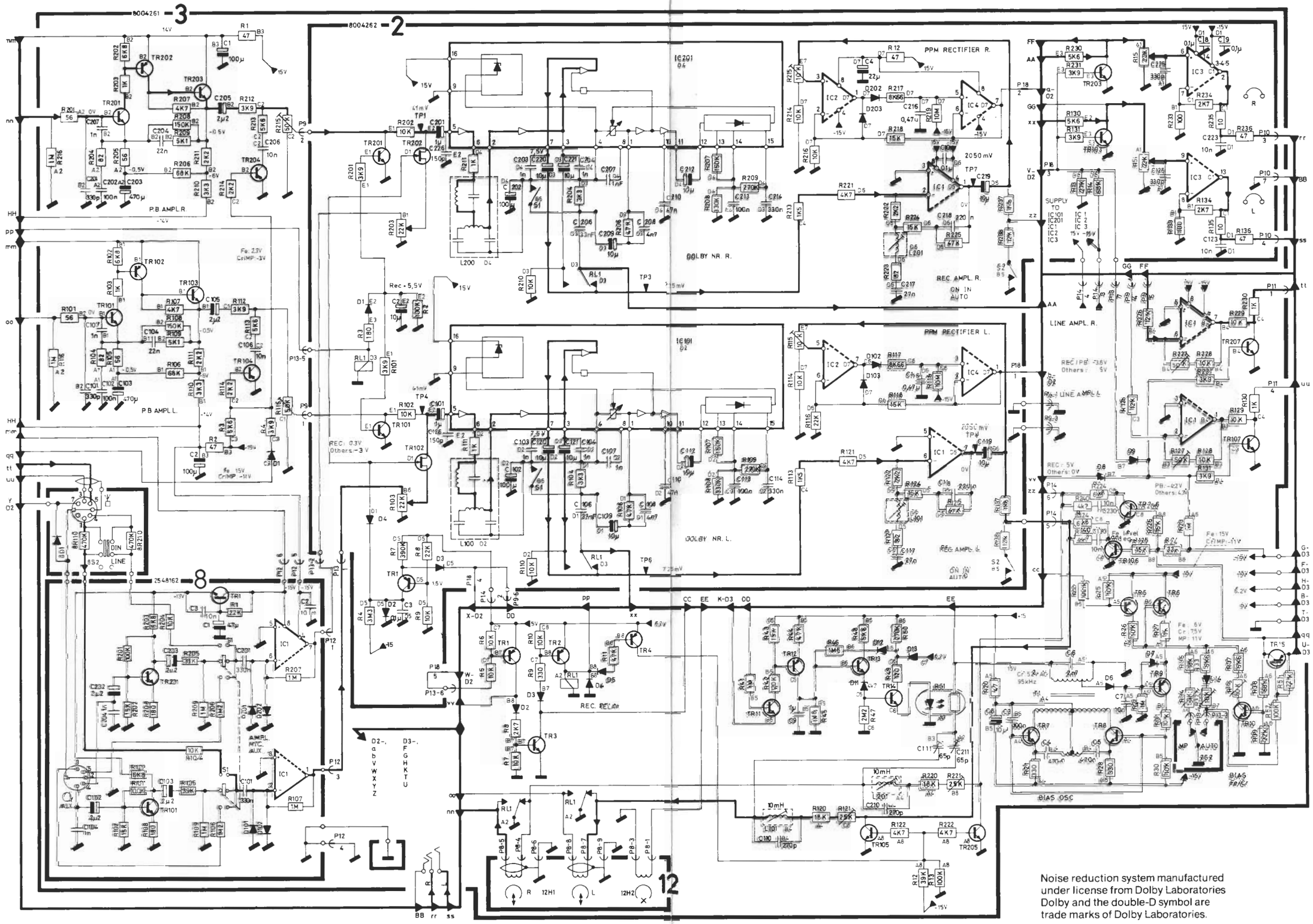


DIAGRAM 2 FOR BEOCORD 6000

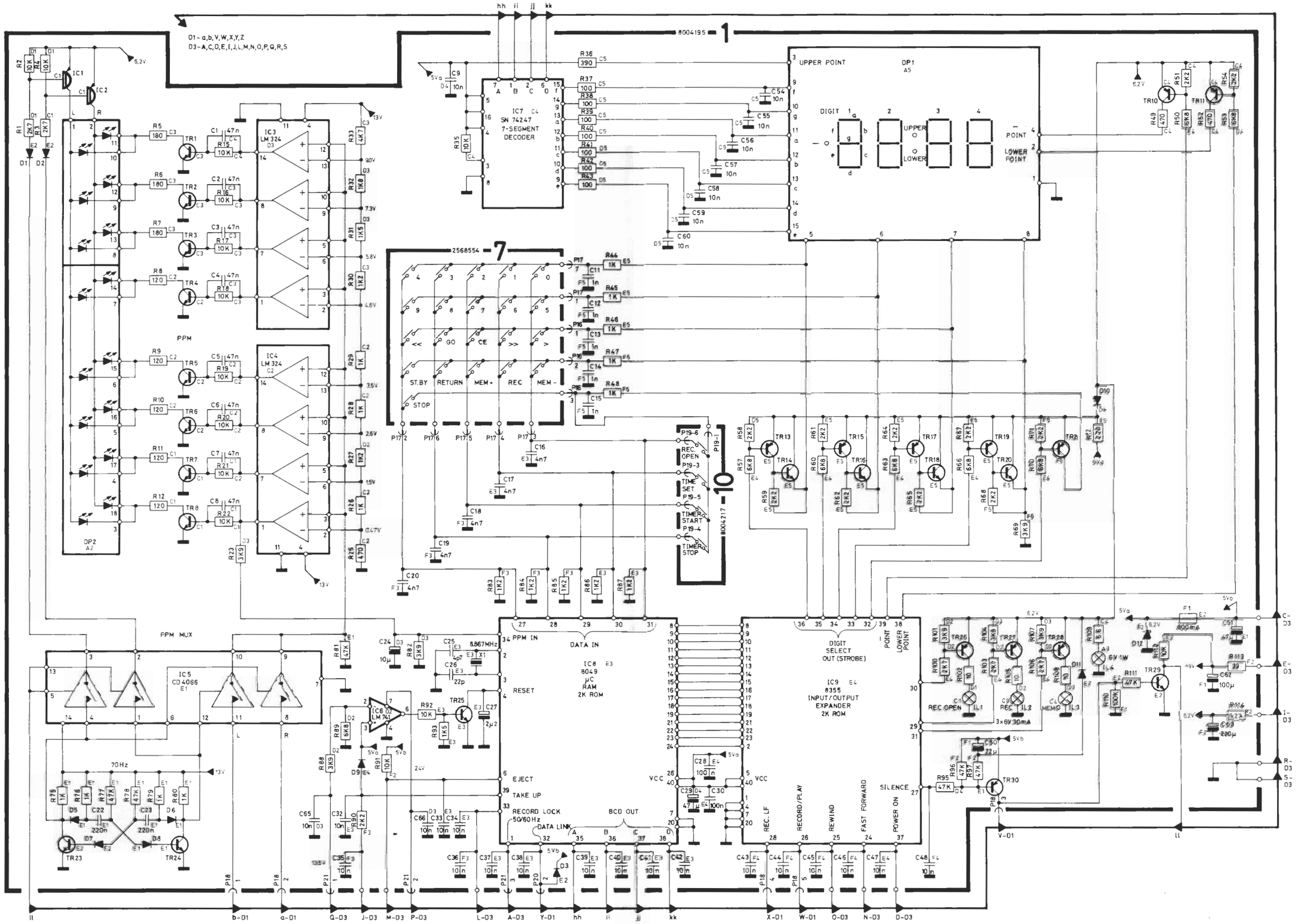
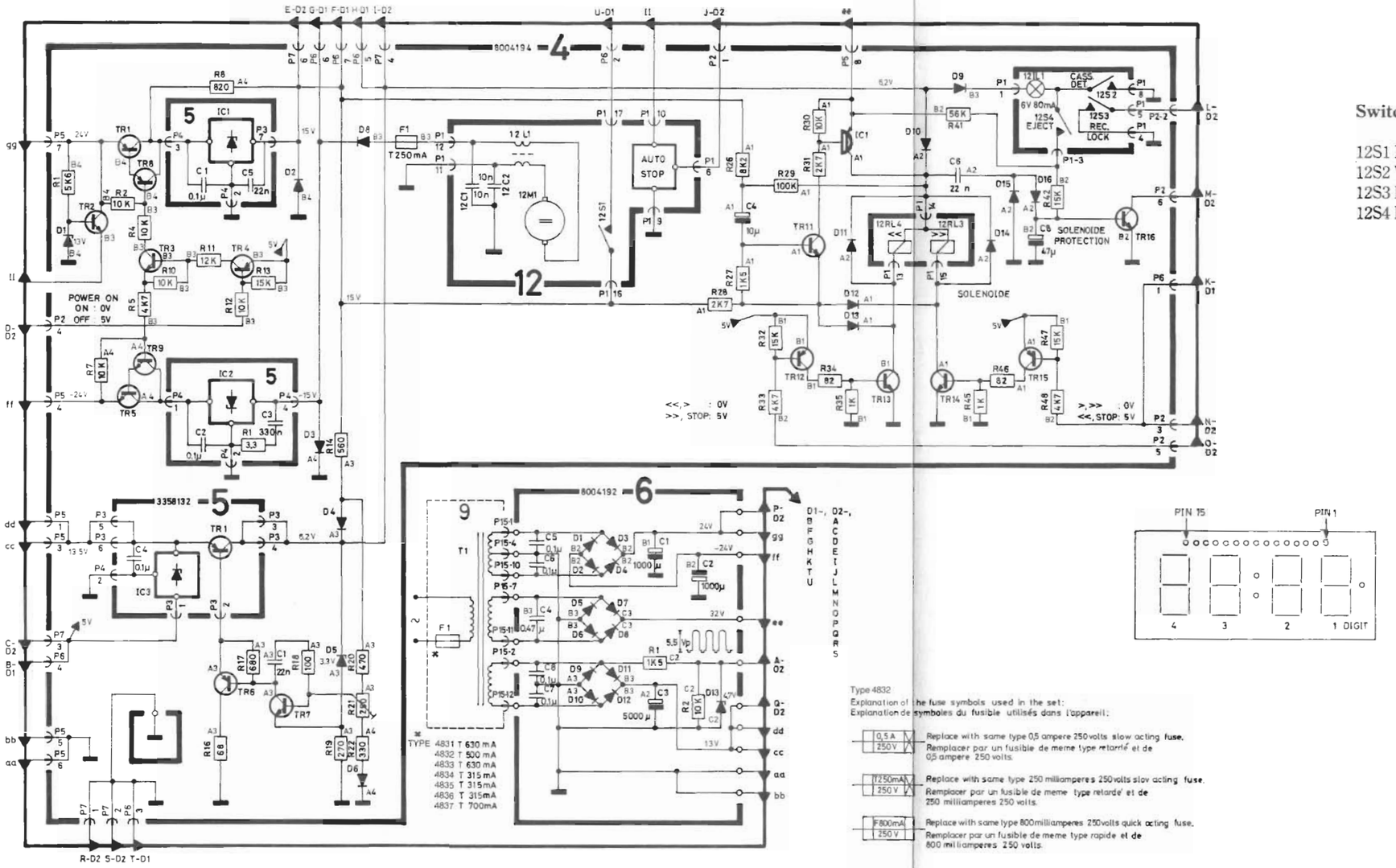


DIAGRAM 3 FOR BEOCORD 6000



FUNCTION TABLE DIAGRAM 2

Switches:

12S1 Fe_2O_3 ON, CrO_2 OFF.
12S2 With cass. ON, without OFF.
12S3 Rec. ON, Rec lock OFF.
12S4 Play ON, Press eject OFF.

PIN	ASSIGNMENT (BOTTOM VIEW)
1	COMMON CATHODE (POINTS)
2	LOWER POINT ANODE
3	UPPER POINT ANODE
4	–POINT ANODE
5	DIGIT 1 ANODE
5	DIGIT 2 ANODE
7	DIGIT 3 ANODE
8	DIGIT 4 ANODE
9	SEG. fCATHODE
10	SEG. gCATHODE
11	SEG. aCATHODE
12	SEG. bCATHODE
13	SEG. cCATHODE
14	SEG. dCATHODE
15	SEG. eCATHODE

Type 4832
Explanation of the fuse symbols used in the set:
Explanation de symboles du fusible utilisés dans l'appareil:

0,5 A / 250 V — Replace with same type 0,5 ampere 250 volts slow acting fuse.
Remplacer par un fusible de meme type retarde et de 0,5 ampere 250 volts.

T250mA / 250 V — Replace with same type 250 milliamperes 250 volts slow acting fuse.
Remplacer par un fusible de meme type retarde et de 250 milliamperes 250 volts.

F800mA / 250 V — Replace with same type 800 milliamperes 250 volts quick acting fuse.
Remplacer par un fusible de meme type rapide et de 800 milliamperes 250 volts.

FUNCTION TABLE FOR MICROCOMPUTER 1IC8-1IC9

	CONDITIONS			FUNCTION	RESULTS							
	1IC8	1IC8	1IC8		1IC9							
PIN	4	33	6		24	25	26	27	28	37	30	29
	1			STAND BY	1	1	1	0	0	1		
	1	1	1	REC OPEN			1		0	0	0	1
	1	1	1	RECORD	0	0	0	1	1	0	0	0
	1			STOP	1	1	1	0	0	0		1
	1		1	≫	0	1	1	0	0	0		1
	1		1	≪	1	0	1	0	0	0		1
	1		1	>	0	0	1	1	0	0		1
	1	1	1	REC PAUSE	1	1	0	1	1	0	0	1/0

FUNCTION TABLE 1IC7 (SN74247)

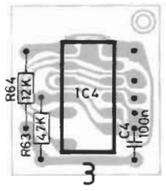
DECIMAL ON DISPLAY	INPUTS D	C	B	A	OUTPUTS a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
∃	1	0	1	1	1	1	0	0	1	1	0
⊏	1	0	1	0	1	1	1	0	0	1	0
⊔	1	1	0	0	1	0	1	1	1	0	0
⊑	1	1	0	1	0	1	1	0	1	0	0
	1	1	1	1	1	1	1	1	1	1	1

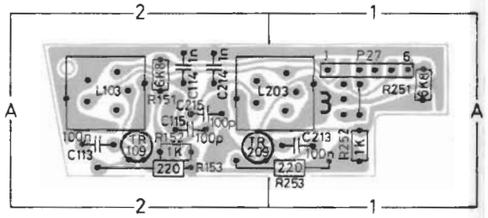
PC 3

In the first produced tape recorders the bias amplifier circuit (3TR109-209) and the MP flip-flop (3IC4) have been constructed on two small intermediate prints. The prints are shown on the below diagrams.
From production No. 2381002 the two circuits mentioned have been incorporated in PC3.
The two intermediate prints are available complete as Nos:
3TR109 – 209 8004282
3IC4 8004283

PC 3

I de først producerede apparater er bias amplifier kredsløbet (3TR109-209), samt MP flip-flopen (3IC4) opbygget på to små mellemprint. Printene er vist på nedenstående skitser.
Fra apparat nr. 2381002 er de nævnte kredsløb indført på PC3.
Mellemprintene kan leveres monteret under nr.:
3TR109 – 209 8004282
3IC4 8004283





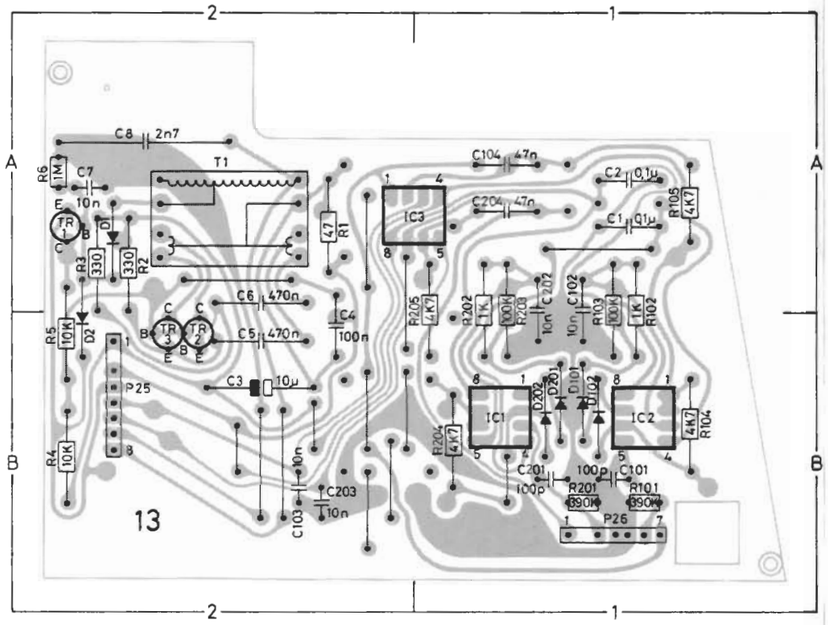


DIAGRAM 1 FOR BEOCORD 8002

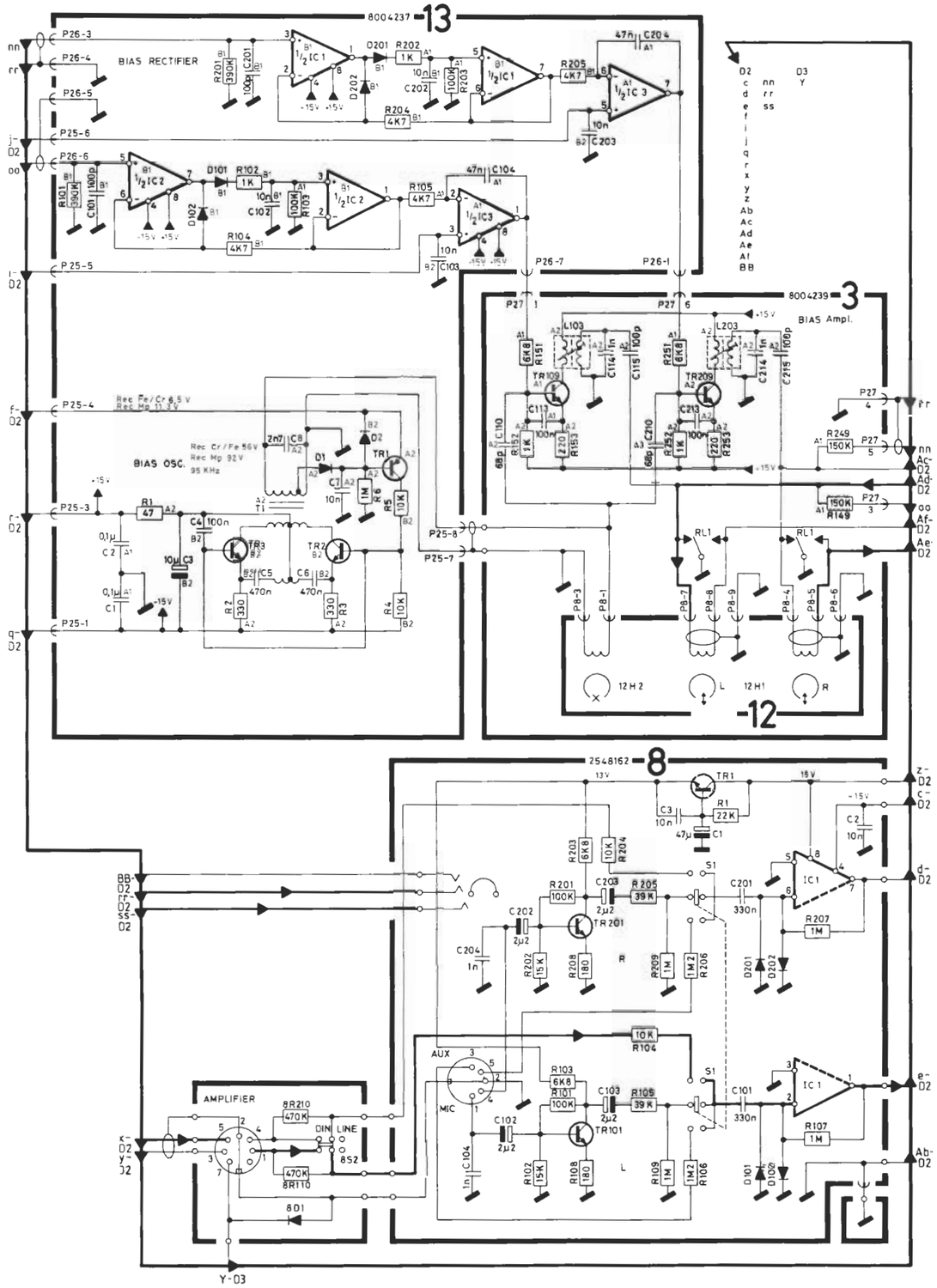
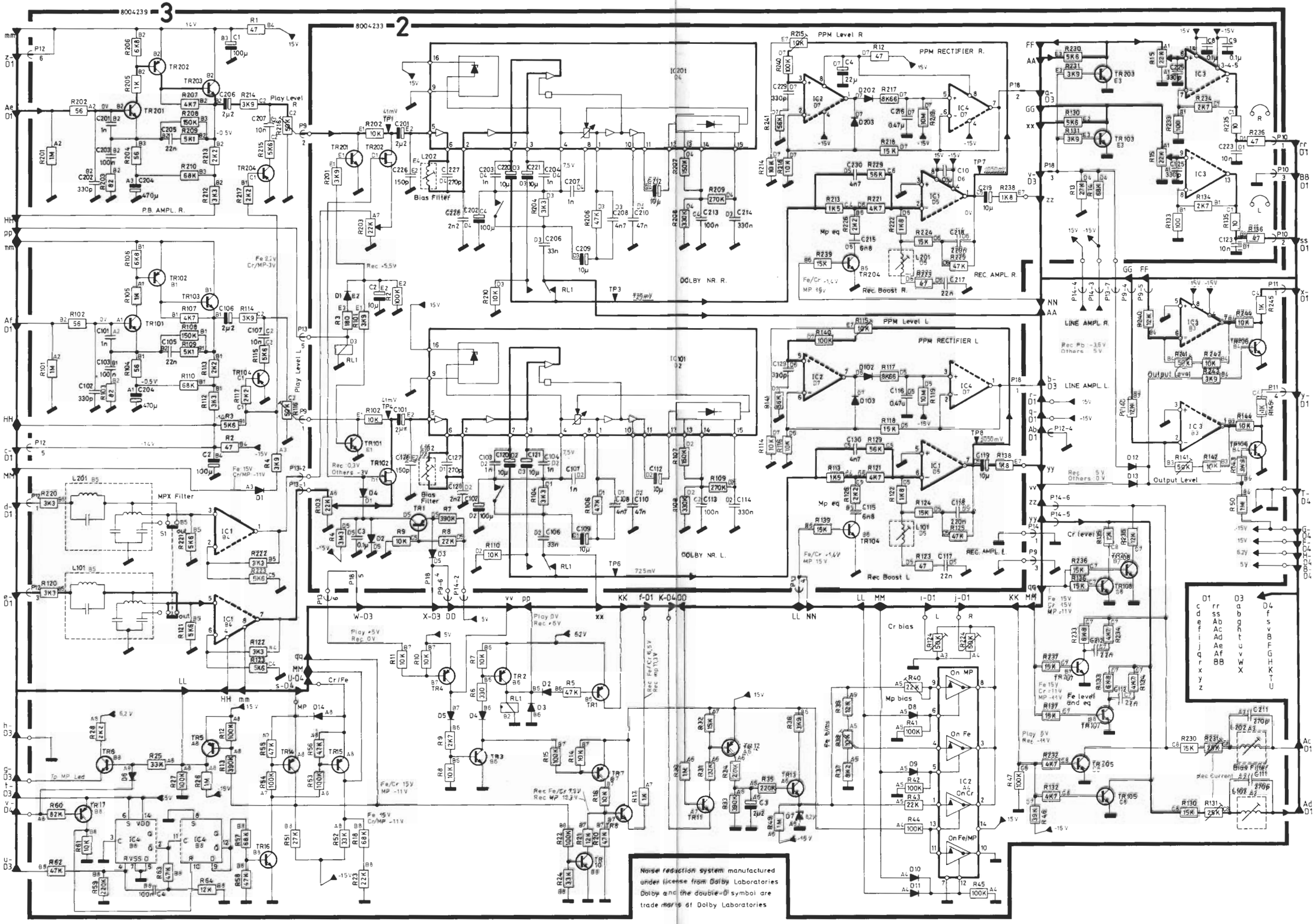


DIAGRAM 2 FOR BEOCORD 8002



Bang&Olufsen

DIAGRAM 3 FOR BEOCORD 8002

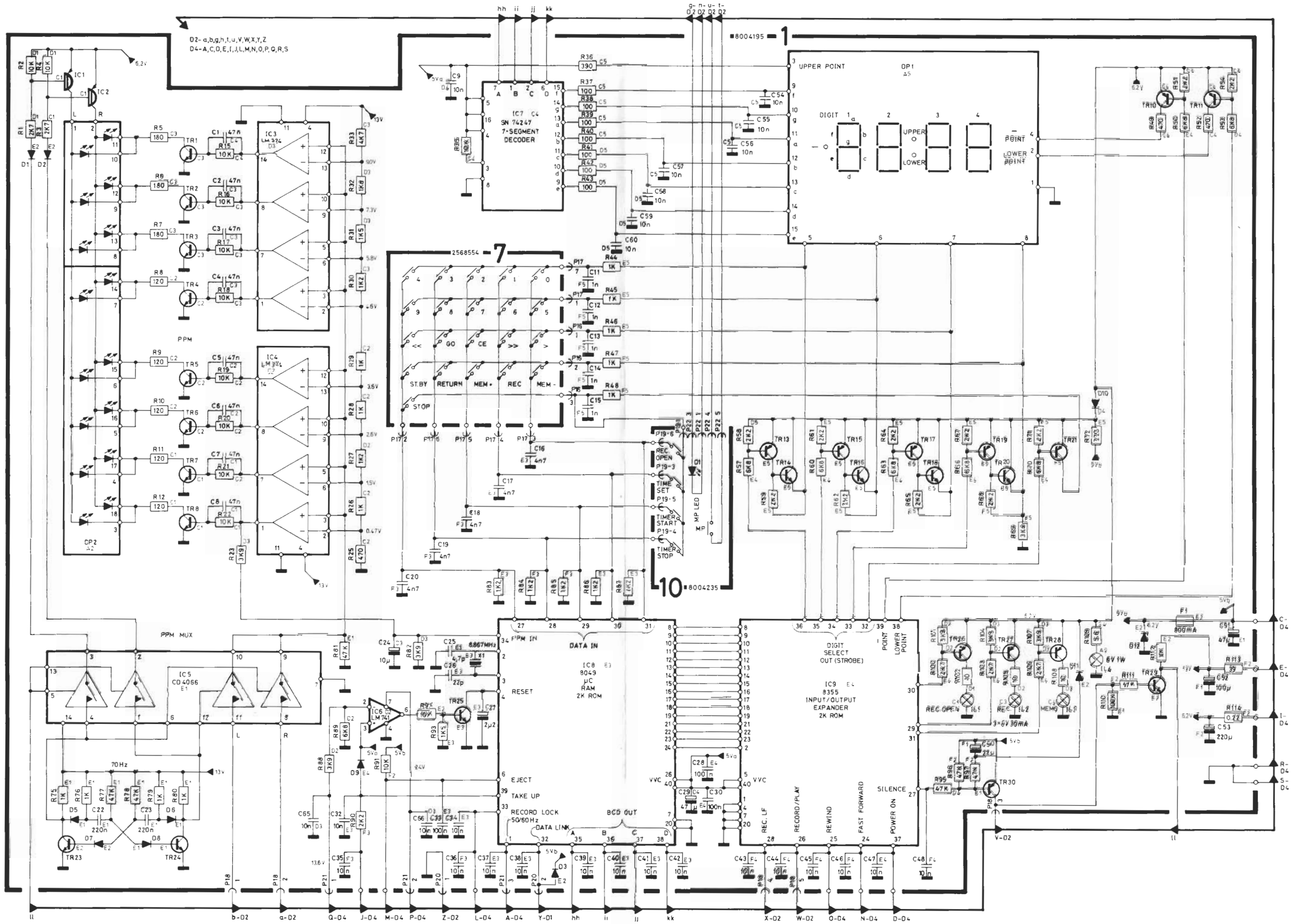
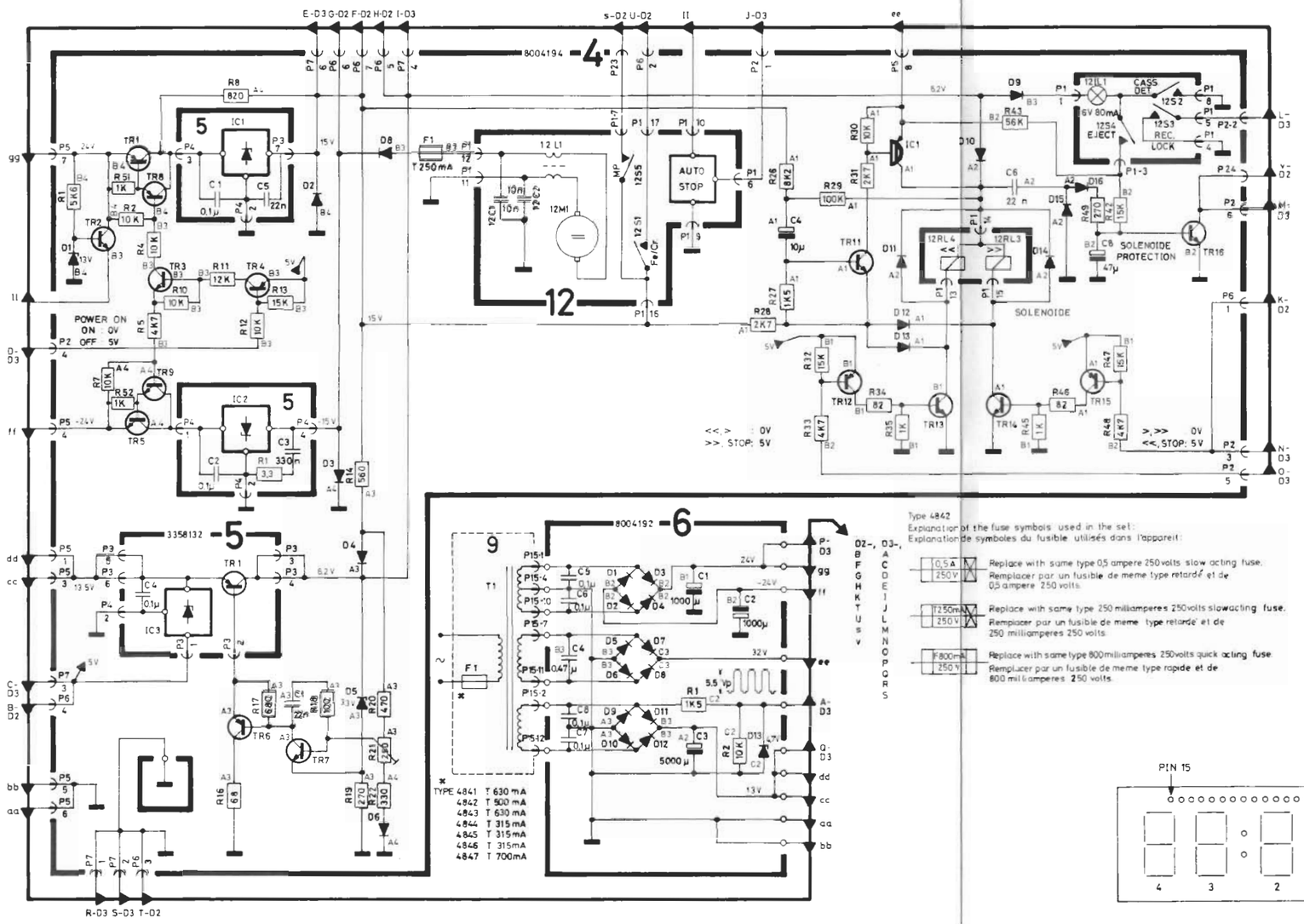


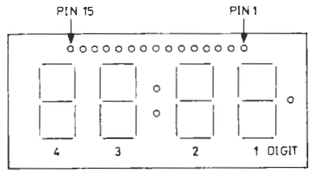
DIAGRAM 4 FOR BEOCORD 8002


8004194 -4-
3358132 -5-
8004192 -6-
POWER ON ON : 0V OFF : 5V
AUTO STOP
SOLENOIDE
SOLENOIDE PROTECTION
<<, > : 0V
>>, STOP: 5V
>, >> 0V
<<, STOP: 5V
REC. LOCK
EJECT
CASS DET
6V 80mA
Type 4842
Explanation of the fuse symbols used in the set:
Explication des symboles du fusible utilisés dans l'appareil:
0,5 A 250 V — Replace with same type 0,5 ampere 250 volts slow acting fuse.
Remplacer par un fusible de meme type retardé et de 0,5 ampere 250 volts.
T250mA 250V — Replace with same type 250 milliamperes 250 volts slowacting fuse.
Remplacer par un fusible de meme type retardé et de 250 milliamperes 250 volts.
F800mA 250V — Replace with same type 800 milliamperes 250 volts quick acting fuse.
Remplacer par un fusible de meme type rapide et de 800 milliamperes 250 volts.
TYPE 4841 T 630 mA
4842 T 500 mA
4843 T 630 mA
4844 T 315 mA
4845 T 315 mA
4846 T 315 mA
4847 T 700 mA
R-D3 S-D3 T-D2

Switches:

12S1 Fe_2O_3 ON, CrO_2 OFF.
12S2 With cass. ON, without OFF.
12S3 Rec. ON, Rec lock OFF.
12S4 Play ON, Press eject OFF.
12S5 MP OFF (With detector hole in cassette).

PIN	ASSIGNMENT (BOTTOM VIEW)
1	COMMON CATHODE (POINTS)
2	LOWER POINT ANODE
3	UPPER POINT ANODE
4	–POINT ANODE
5	DIGIT 1 ANODE
5	DIGIT 2 ANODE
7	DIGIT 3 ANODE
8	DIGIT 4 ANODE
9	SEG. fCATHODE
10	SEG. gCATHODE
11	SEG. aCATHODE
12	SEG. bCATHODE
13	SEG. cCATHODE
14	SEG. dCATHODE
15	SEG. eCATHODE



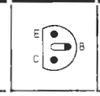
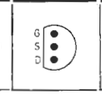
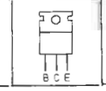
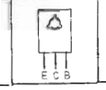
FUNCTION TABLE FOR MICROCOMPUTER 1IC8-1IC9

	CONDITIONS			FUNCTION	RESULTS							
	1IC8	1IC8	1IC8		1IC 9							
PIN	4	33	6		24	25	26	27	28	37	30	29
	1			STAND BY	1	1	1	0	0	1		
	1	1	1	REC OPEN			1		0	0	0	1
	1	1	1	RECORD	0	0	0	1	1	0	0	0
	1			STOP	1	1	1	0	0	0		1
	1		1	≫	0	1	1	0	0	0		1
	1		1	≪	1	0	1	0	0	0		1
	1		1	>	0	0	1	1	0	0		1
	1	1	1	REC PAUSE	1	1	0	1	1	0	0	1/0

FUNCTION TABLE 1IC7 (SN74247)

DECIMAL ON DISPLAY	INPUTS D	C	B	A	OUTPUTS a	b	c	d	e	f	g
0	0	0	0	0	0	0	0	0	0	0	1
1	0	0	0	1	1	0	0	1	1	1	1
2	0	0	1	0	0	0	1	0	0	1	0
3	0	0	1	1	0	0	0	0	1	1	0
4	0	1	0	0	1	0	0	1	1	0	0
5	0	1	0	1	0	1	0	0	1	0	0
6	0	1	1	0	0	1	0	0	0	0	0
7	0	1	1	1	0	0	0	1	1	1	1
8	1	0	0	0	0	0	0	0	0	0	0
9	1	0	0	1	0	0	0	0	1	0	0
⊐	1	0	1	1	1	1	0	0	1	1	0
⊏	1	0	1	0	1	1	1	0	0	1	0
⊔	1	1	0	0	1	0	1	1	1	0	0
⊑	1	1	0	1	0	1	1	0	1	0	0
	1	1	1	1	1	1	1	1	1	1	1

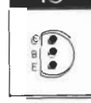
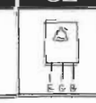
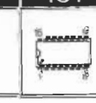
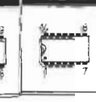
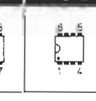
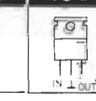
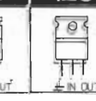
BEOCORD 6000
LIST OF TRANSISTORS

19	20	24	31	32			
							

1TR1	8320097	**20**	BC 547B
1TR2			
1TR3			
1TR4			
1TR5			
1TR6			
1TR7			
1TR8			
1TR10	8320152	**20**	BC 557B
1TR11			
1TR13			
1TR14	8320329	**20**	BC 338-25/18
1TR15	8320152	**20**	BC 557B
1TR16	8320329	**20**	BC 338-25/18
1TR17	8320152	**20**	BC 557B
1TR18	8320329	**20**	BC 338-25/18
1TR19	8320152	**20**	BC 557B
1TR20	8320329	**20**	BC 338-25/18
1TR21	8320152	**20**	BC 557B
1TR23	8320097	**20**	BC 547B
1TR24			
1TR25			
1TR26	8320152	**20**	BC 557B
1TR27			
1TR28			
1TR29	8320097	**20**	BC 547B
1TR30	8320152	**20**	BC 557B
2TR1	8320152	**20**	BC 557B
2TR101/201	8320097	**20**	BC 547B
2TR102/202*	8320396	**24**	2N 5639
		24	MPF 4392
2TR103/203	8320097	**20**	BC 547B
3TR1	8320152	**20**	BC 557B
3TR2	8320331	**20**	BC 328-25/18
3TR3	8320097	**20**	BC 547B
3TR4	8320152	**20**	BC 557B
3TR5			
3TR6	8320097	**20**	BC 547B
3TR7	8320237	**20**	BC 546B
3TR8			
3TR9	8320152	**20**	BC 557B
3TR10	8320097	**20**	BC 547B
3TR11			
3TR12	8320152	**20**	BC 557B
3TR13	8320097	**20**	BC 547B
3TR14			
3TR15	8320152	**20**	BC 557B
3TR101/201*	8320344	**20**	BC 550B
3TR102/202*	8320069	**20**	BC 559B
3TR103/203	8320097	**20**	BC 547B
3TR104/204	8320152	**20**	BC 557B
3TR105/205	8320366	**19**	NPS A16
3TR106/206			
3TR107/207	8320097	**20**	BC 547B
4TR1	8320428	**32**	BD 438
4TR2	8320097	**20**	BC 547B
4TR3	8320321	**19**	MPS A06
4TR4	8320152	**20**	BC 557B
4TR5	8320427	**32**	BD 437
4TR6	8320152	**20**	BC 557B
4TR7	8320097	**20**	BC 547B
4TR8	8320152	**20**	BC 557B
4TR9	8320097	**20**	BC 547B
4TR11	8320321	**19**	MPS A06
4TR12	8320331	**20**	BC 328-25/18
4TR13	8320441	**32**	BD 439
4TR14			
4TR15	8320331	**20**	BC 328-25/18
4TR16	8320457	**20**	MTJ 619
5TR1	8320369	**31**	BP534
8TR1	8320097	**20**	BC 547B
8TR101/201*	8320344	**20**	BC 550B

* Speciel udvalgt eller bearbejdet eksemplar.
* Specially selected or adapted sample.
* Speziell ausgewähltes und bearbeitets exemplar.

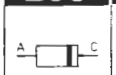
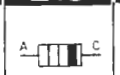
LIST OF IC's

19	32	101	102	103	105	123	124
							

1IC1	8340025	**19**	MPSA 65
1IC2		**19**	SPS 5431
1IC3	8340157	**102**	LM 324N
1IC4		**102**	TDB 0124DP
		102	MLM 324P
1IC5	8340209	**102**	CD 4016 BCN
		102	HEF 4016BP
		102	MC4016BLP
1IC6	8340141	**103**	LM 741CN
		103	µA 741CP
		103	µA 741CN
		103	SFC 741DC
1IC7	8340156	**101**	SN 74247N
1IC8	8340158	**124**	µP 8049
1IC9	8340159	**124**	EXP 8355
2IC1	8340294	**103**	LF 353N
2IC2			
2IC3	8340232	**102**	LM 378
2IC4	8340294	**103**	LF 353N
**2IC101/201	8340295	**101**	LM 1111BN
3IC1	8340048	**103**	MC 1458CP1
4IC1	8340207	**32**	BD 678
5IC1	8340208	**105**	µA 78M15uC
		105	MC 78 M 15 CT
		105	µA 78 M 15 CKC
5IC2	8340240	**123**	µA 7915 uC
		123	LM 3207-15
		123	MC 7915 CT
5IC3	8340212	**105**	MC 78 M 5 CT
		105	µA 78 M 5 CKC
		105	µA 78 M 5 uC
8IC1	8340294	**103**	LF 353 N
12IC14	8004216		Hall-element

** See section 11

LIST OF DIODES

209	215	217	218				
							

1D1	8300058	**217**	SFD 184
1D2		**215**	1N 4148
1D3		**209**	1N 4148
1D5			
1D6			
1D7			
1D8			
1D9			
1D10	8300189	**218**	BAV 19
		218	BA 219/TB
1D11	8300058	**217**	SFD 184
		215	1N 4148
		209	1N 4148
1D12	8300201	**209**	ZPD 6.2V5%
		209	BZX 79C6V2
		209	BZX 83C6V2
1DP1	8330011		FCS 8499
1DP2	8330003		FNA 0098
2D1	8300058	**217**	SFD 184
2D2		**215**	1N 4148
2D3		**209**	1N 4148
2D4			
2D102/202			
2D103/203			
3D1	8300058	**217**	SFD 184
3D2		**215**	1N 4148
3D3		**209**	1N 4148
3D4	8300189	**218**	BAV 19
		218	BA 219/TB
3D5	8300058	**217**	SFD 184
3D6		**215**	1N 4148
3D7		**209**	1N 4148
3D8			
3D9			
3D11	8300036	**209**	ZPD 4.7V5%
		209	BZX 79C4V7
		209	BZX 83C4V7
3D12	8300058	**217**	SFD 184
3D13		**215**	1N 4148
3D14		**209**	1N 4148

4D1	8300218	**209**	ZPD 13V5%
		209	BZX 79C
			13V0
		209	BZX 83C
			13V0
4D2	8300023	**209**	1N 4002/RL
4D3			
4D4	8300058	**217**	SFD 184
		215	1N 4148
		209	1N 4148
4D5	8300135	**209**	ZPD 3.3V5%
		209	BZX 79C3V3
		209	BZX 83C3V3
4D6	8300058	**217**	SFD 184
		215	1N 4148
		209	1N 4148
4D8	8300023	**209**	1N 4002/RL
4D9			
4D10			
4D11			
4D12	8300058	**217**	SFD 184
		215	1N 4148
		209	1N 4148
4D14	8300023	**209**	1N 4002/RL
4D15	8300058	**217**	SFD 184
4D16		**215**	1N 4148
		209	1N 4148
6D1	8300023	**209**	1N 4002/RL
6D2			
6D3			
6D4			
6D5			
6D6			
6D7			
6D8			
6D9	8300294	**209**	MR 501 RL
6D10		**209**	1N 5401
6D11		**209**	1N 5401 RL
6D12			

BEOCORD 8002
LIST OF TRANSISTORS

19	20	102	103				

2TR104/204	8320097	**20**	BC547B
3TR7	8320152	**20**	BC 557B
3TR8	8320097	**20**	BC 547B
3TR14	8320152	**20**	BC 557B
3TR16	8320097	**20**	BC 547B
3TR17	8320152	**20**	BC 557B

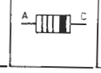
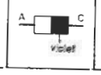
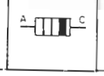
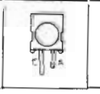
3TR106/206	8320097	**20**	BC 547B
3TR107/207	8320366	**19**	NPS A 16
3TR108/208			
3TR109/209	8320237	**20**	BC 546B
13TR1	8320152	**20**	BC 557B
13TR2	8320237	**20**	BC 546B
13TR3			

LIST OF IC's

3IC1	8340195	**103**	LF 353 N
		103	TL 072 CP
		103	µAF 772 TC
3IC2	8340202	**102**	HEF 4066BP
		102	CD4066BCN
3IC3	8340195	**103**	LF 353 N
		103	TL 072 CP
		103	µAF 772TC

3IC4	8340176	**102**	CD4013BCN
		102	MC4013BCP
		102	HEF 4013BP
13IC1	8340294	**103**	LF 353N
13IC2			
13IC3	8340048	**103**	MC 1458CP1

LIST OF DIODES

209	215	217	218	227			
							

3D3	8300189	**218**	BAV 19
		218	BA 219/TB
3D4	8300058	**217**	SFD 184
3D5		**215**	1N 4148
3D6		**209**	1N 4148
3D7	8300173	**209**	ZPD 8.2V5%
		209	BZX 79C 8V2
		209	BZX 83C 8V2

3D8	8300058	**217**	SFD 184
3D9		**215**	1N 4148
3D10		**209**	1N 4148
3D11			
3D12			
3D13			
3D14			
10D1	8330038	**227**	MW 57124
13D1	8300058	**217**	SFD 184
13D2		**215**	1N 4148
13D101/201		**209**	1N 4148
13D102/202			

8D1	8300058	**217**	SFD 184
8D101/201		**215**	1N 4148
8D102/202		**209**	1N 4148

LIST OF ELECTRICAL PARTS
Beocord 6000
Microcomputer and display, 8004195, PC1

R1	5010298	2.7 kohms ±5% 1/8W	R59	5010064	2.2 kohms ±5% 1/8W
R2	5010059	10 kohms ±5% 1/8W	R60	5010052	6.8 kohms ±5% 1/8W
R3	5010298	2.7 kohms ±5% 1/8W	R61	5010064	2.2 kohms ±5% 1/8W
R4	5010059	10 kohms ±5% 1/8W	R62	5010064	2.2 kohms ±5% 1/8W
R5	5010362	180 ohms ±5% 1/8W	R63	5010052	6.8 kohms ±5% 1/8W
R6	5010362	180 ohms ±5% 1/8W	R64	5010064	2.2 kohms ±5% 1/8W
R7	5010362	180 ohms ±5% 1/8W	R65	5010064	2.2 kohms ±5% 1/8W
R8	5010128	120 ohms ±5% 1/8W	R66	5010052	6.8 kohms ±5% 1/8W
R9	5010128	120 ohms ±5% 1/8W	R67	5010064	2.2 kohms ±5% 1/8W
R10	5010128	120 ohms ±5% 1/8W	R68	5010064	2.2 kohms ±5% 1/8W
R11	5010128	120 ohms ±5% 1/8W	R69	5010069	3.9 kohms ±5% 1/8W
R12	5010128	120 ohms ±5% 1/8W	R70	5010052	6.8 kohms ±5% 1/8W
R15	5010059	10 kohms ±5% 1/8W	R71	5010064	2.2 kohms ±5% 1/8W
R16	5010059	10 kohms ±5% 1/8W	R72	5010092	220 ohms ±5% 1/8W
R17	5010059	10 kohms ±5% 1/8W	R75	5010040	1 kohms ±5% 1/8W
R18	5010059	10 kohms ±5% 1/8W	R76	5010040	1 kohms ±5% 1/8W
R19	5010059	10 kohms ±5% 1/8W	R77	5010045	47 kohms ±5% 1/8W
R20	5010059	10 kohms ±5% 1/8W	R78	5010045	47 kohms ±5% 1/8W
R21	5010059	10 kohms ±5% 1/8W	R79	5010040	1 kohms ±5% 1/8W
R22	5010059	10 kohms ±5% 1/8W	R80	5010040	1 kohms ±5% 1/8W
R23	5010069	3.9 kohms ±5% 1/8W	R81	5010045	47 kohms ±5% 1/8W
R25	5010058	470 ohms ±5% 1/8W	R82	5010069	3.9 kohms ±5% 1/8W
R26	5010040	1 kohms ±5% 1/8W	R83	5010153	1.2 kohms ±5% 1/8W
R27	5010153	1.2 kohms ±5% 1/8W	R84	5010153	1.2 kohms ±5% 1/8W
R28	5010040	1 kohms ±5% 1/8W	R85	5010153	1.2 kohms ±5% 1/8W
R29	5010040	1 kohms ±5% 1/8W	R86	5010153	1.2 kohms ±5% 1/8W
R30	5010153	1.2 kohms ±5% 1/8W	R87	5010153	1.2 kohms ±5% 1/8W
R31	5010247	1.5 kohms ±5% 1/8W	R88	5010069	3.9 kohms ±5% 1/8W
R32	5010066	1.8 kohms ±5% 1/8W	R89	5010052	6.8 kohms ±5% 1/8W
R33	5010048	4.7 kohms ±5% 1/8W	R90	5010064	2.2 kohms ±5% 1/8W
R35	5010059	10 kohms ±5% 1/8W	R91	5010059	10 kohms ±5% 1/8W
R36	5010070	390 ohms ±5% 1/8W	R92	5010059	10 kohms ±5% 1/8W
R37	5010065	100 ohms ±5% 1/8W	R93	5010247	1.5 kohms ±5% 1/8W
R38	5010065	100 ohms ±5% 1/8W	R95	5010045	47 kohms ±5% 1/8W
R39	5010065	100 ohms ±5% 1/8W	R96	5010045	47 kohms ±5% 1/8W
R40	5010065	100 ohms ±5% 1/8W	R97	5010045	47 kohms ±5% 1/8W
R41	5010065	100 ohms ±5% 1/8W	R100	5010298	2.7 kohms ±5% 1/8W
R42	5010065	100 ohms ±5% 1/8W	R101	5010069	3.9 kohms ±5% 1/8W
R43	5010065	100 ohms ±5% 1/8W	R102	5010506	10 ohms ±5% 1/8W
R44	5010040	1 kohms ±5% 1/8W	R103	5010298	2.7 kohms ±5% 1/8W
R45	5010040	1 kohms ±5% 1/8W	R104	5010069	3.9 kohms ±5% 1/8W
R46	5010040	1 kohms ±5% 1/8W	R105	5010506	10 ohms ±5% 1/8W
R47	5010040	1 kohms ±5% 1/8W	R106	5010298	2.7 kohms ±5% 1/8W
R48	5010040	1 kohms ±5% 1/8W	R107	5010069	3.9 kohms ±5% 1/8W
R49	5010058	470 ohms ±5% 1/8W	R108	5010506	10 ohms ±5% 1/8W
R50	5010052	6.8 kohms ±5% 1/8W	R109	5001165	5.6 ohms ±10% 1/2W
R51	5010064	2.2 kohms ±5% 1/8W	R110	5010049	100 kohms ±5% 1/8W
R52	5010058	470 ohms ±5% 1/8W	R111	5010045	47 kohms ±5% 1/8W
R53	5010052	6.8 kohms ±5% 1/8W	R112	5010059	10 kohms ±5% 1/8W
R54	5010064	2.2 kohms ±5% 1/8W	R113	5010782	39 ohms ±5% 1/4W
R57	5010052	6.8 kohms ±5% 1/8W	R114	5102016	0.22 ohms ±10% 1W
R58	5010064	2.2 kohms ±5% 1/8W			

C1	4030015	47 nF -20+80% 16V	C26	4003059	22 pF ±5% 250V
C2	4030015	47 nF -20+80% 16V	C27	4201069	2.2 µF ±20% 35V
C3	4030015	47 nF -20+80% 16V	C28	4030010	100 nF -20+100% 16V
C4	4030015	47 nF -20+80% 16V	C29	4200092	47 µF 16V
C5	4030015	47 nF -20+80% 16V	C30	4030010	100 nF -20+100% 16V
C6	4030015	47 nF -20+80% 16V	C32	4010041	10 nF -20+80% 40V
C7	4030015	47 nF -20+80% 16V	C33	4130179	100 nF ±20% 63V
C8	4030015	47 nF -20+80% 16V	C34	4040041	10 nF -20+80% 40V
C9	4010041	10 nF -20+80% 40V	C35	4010041	10 nF -20+80% 40V
C11	4010027	1 nF ±10% 100V	C36	4010041	10 nF -20+80% 40V
C12	4010027	1 nF ±10% 100V	C37	4010041	10 nF -20+80% 40V
C13	4010027	1 nF ±10% 100V	C38	4010041	10 nF -20+80% 40V
C14	4010027	1 nF ±10% 100V	C39	4010041	10 nF -20+80% 40V
C15	4010027	1 nF ±10% 100V	C40	4010041	10 nF -20+80% 40V
C16	4010063	4.7 nF ±10% 63V	C41	4010041	10 nF -20+80% 40V
C17	4010063	4.7 nF ±10% 63V	C42	4010041	10 nF -20+80% 40V
C18	4010063	4.7 nF ±10% 63V	C43	4010041	10 nF -20+80% 40V
C19	4010063	4.7 nF ±10% 63V	C44	4010041	10 nF -20+80% 40V
C20	4010063	4.7 nF ±10% 63V	C45	4010041	10 nF -20+80% 40V
C22	4130104	220 nF ±20% 100V	C46	4010041	10 nF -20+80% 40V
C23	4130104	220 nF ±20% 100V	C47	4010041	10 nF -20+80% 40V
C24	4200167	10 µF ±20% 10V	C48	4010041	10 nF -20+80% 40V
C25	4000020	4.7 pF ±0.25 pF 63V	C50	4200100	22 µF 40V

Rec. Dolby NR 8004262, PC2

C51	4200092	47 µF 16V	C57	4010041	10 nF -20+80% 40V
C52	4200099	100 µF 16V	C58	4010041	10 nF -20+80% 40V
C53	4200118	220 µF 10V	C59	4010041	10 nF -20+80% 40V
C54	4010041	10 nF -20+80% 40V	C60	4010041	10 nF -20+80% 40V
C55	4010041	10 nF -20+80% 40V	C65	4010041	10 nF -20+80% 40V
C56	4010041	10 nF -20+80% 40V	C66	4010041	10 nF -20+80% 40V
IL1	8230057	6V 30mA	IL3	8230057	6V 30mA
IL2	8230057	6V 30mA	IL4	8230062	6V 1W
X1	8090005	8.8672 MHz			
F1	6604004	800mA-F/250V S IEC 127		7500002	Holder for F1
	7200055	Socket for µC	P17	7210232	Socket 7 pins
	3302312	Screen for µC	P18	7210216	Socket 5 pins
P16	7210229	Socket 3 pins	P20/P21	7220167	Plug 6 pins

R2	5010049	100 kohms ±5% 1/8W	R213	5010247	1.5 kohms ±5% 1/8W
R3	5010362	180 ohms ±5% 1/8W	R214	5010059	10 kohms ±5% 1/8W
R4	5010848	3.3 Mohms ±10% 1/8W	R215	5370074	10 kohms LIN
R7	5010073	390 kohms ±5% 1/8W	R216	5010079	22 kohms ±5% 1/8W
R8	5010079	22 kohms ±5% 1/8W	R217	5020145	8.66 kohms ±1% 1/8W
R9	5010059	10 kohms ±5% 1/8W	R218	5010053	15 kohms ±5% 1/8W
R12	5010742	47 ohms ±5% 1/8W	R219	5010638	10 Mohms ±10% 1/8W
R13	5010141	27 kohms ±5% 1/8W	R221	5010048	4.7 kohms ±5% 1/8W
R14	5010062	68 kohms ±5% 1/8W	R222	5010064	2.2 kohms ±5% 1/8W
R15	5310091	2 x 22 kohms Log	R223	5010056	82 ohms ±5% 1/8W
R201	5010069	3.9 kohms ±5% 1/8W	R224	5010053	15 kohms ±5% 1/8W
R202	5010059	10 kohms ±5% 1/8W	R225	5010045	47 kohms ±5% 1/8W
R203	5310105	22 kohms Log paired	R230	5010041	5.6 kohms ±5% 1/8W
R204	5010265	3.3 kohms ±2% 1/4W	R231	5010069	3.9 kohms ±5% 1/8W
R206	5010045	47 kohms ±5% 1/8W	R233	5010065	100 ohms ±5% 1/8W
R207	5010063	150 kohms ±5% 1/8W	R234	5010298	2.7 kohms ±5% 1/8W
R208	5010117	330 kohms ±5% 1/8W	R235	5010506	10 ohms ±5% 1/8W
R209	5010083	270 kohms ±5% 1/8W	R236	5001008	47 ohms ±10% 1/2W
R210	5010059	10 kohms ±5% 1/8W	R237	5010066	1.8 kohms ±5% 1/8W
R211	5010040	1 kohms ±5% 1/8W	R238	5010046	12 kohms ±5% 1/8W

C2	4201065	10 µF 63V	C210	4130087	47 nF ±10% 250V
C3	4130107	0.1 µF ±10% 250V	C212	4200342	10 µF -10+50% 63V
C4	4200100	22 µF 40V	C213	4130150	100 nF ±20% 100V
C8	4130107	0.1 µF ±10% 250V	C214	4130106	330 nF ±20% 100V
C9	4130107	0.1 µF ±10% 250V	C216	4130114	470 nF ±10% 100V
C10	4130107	0.1 µF ±10% 250V	C217	4130166	27 nF ±5% 250V
C201	4130136	1 µF ±20% 100V	C218	4130142	220 nF ±5% 100V
C202	4200099	100 µF 16V	C219	4200342	10 µF -10+50% 63V
C203	4010027	1 nF ±10% 100V	C220	4200342	10 µF -10+50% 63V
C204	4010027	1 nF ±10% 100V	C221	4200342	10 µF -10+50% 63V
C206	4130194	33 nF ±5% 250V	C223	4010041	10 nF -20+80% 40V
C207	4010027	1 nF ±10% 100V	C225	4010062	330 pF ±10% 100V
C208	4100031	4.7 nF ±1% 63V	C226	4000023	150 pF ±5% 63V
C209	4200342	10 µF -10+50% 63V			

L200	8022104	10.6 µH	3304017	Screen for L201
L201	8022059	2.8 mH		
P10	7220166	Plug 3 pins		
P18	7220202	Plug 5 pins		
RL1	7600065	Relay 6V		
S1	7400200	2 pol.	3358150	Heat sink
S2	7400201	4 pol.		

Play back, Bias, 8004261, PC3

R1	5010742	47 ohms ±5% 1/8W	R45	5010791	1.8 Mohms ±10% 1/8W
R2	5010742	47 ohms ±5% 1/8W	R46	5010093	1.5 Mohms ±10% 1/8W
R3	5010041	5.6 kohms ±5% 1/8W	R47	5010245	2.2 Mohms ±10% 1/8W
R4	5010069	3.9 kohms ±5% 1/8W	R48	5010041	5.6 kohms ±5% 1/8W
R5	5010059	10 kohms ±5% 1/8W	R49	5010128	120 ohms ±5% 1/8W
R6	5010059	10 kohms ±5% 1/8W	R50	5010083	270 kohms ±5% 1/8W
R7	5010059	10 kohms ±5% 1/8W	R51	5010079	22 kohms ±5% 1/8W
R8	5010298	2.7 kohms ±5% 1/8W	R52	5010049	100 kohms ±5% 1/8W
R9	5010044	330 ohms ±5% 1/8W	R201	5010151	56 ohms ±5% 1/8W
R10	5010059	10 kohms ±5% 1/8W	R202	5010052	6.8 kohms ±5% 1/8W
R11	5010045	47 kohms ±5% 1/8W	R203	5010040	1 kohms ±5% 1/8W
R12	5010060	39 kohms ±5% 1/8W	R204	5010056	82 ohms ±5% 1/8W
R13	5010049	100 kohms ±5% 1/8W	R205	5010151	56 ohms ±5% 1/8W
R20	5010742	47 ohms ±5% 1/8W	R206	5010062	68 kohms ±5% 1/8W
R21	5011019	330 ohms ±5% 1/4W	R207	5010048	4.7 kohms ±5% 1/8W
R22	5010049	100 kohms ±5% 1/8W	R208	5010063	150 kohms ±5% 1/8W
R23	5010054	1 Mohms ±5% 1/8W	R209	5010733	5.1 kohms ±5% 1/8W
R24	5010075	33 kohms ±5% 1/8W	R210	5010076	3.3 kohms ±5% 1/8W
R25	5010059	10 kohms ±5% 1/8W	R211	5010064	2.2 kohms ±5% 1/8W
R26	5010059	10 kohms ±5% 1/8W	R212	5010069	3.9 kohms ±5% 1/8W
R27	5010040	1 kohms ±5% 1/8W	R213	5010041	5.6 kohms ±5% 1/8W
R28	5011019	330 ohms ±5% 1/4W	R214	5010064	2.2 kohms ±5% 1/8W
R29	5010054	1 Mohms ±5% 1/8W	R215	5370061	50 kohms LIN
R30	5010059	10 kohms ±5% 1/8W	R216	5010054	1 Mohms ±5% 1/8W
R31	5010059	10 kohms ±5% 1/8W	R220	5010135	18 kohms ±5% 1/8W
R32	5370074	10 kohms LIN	R221	5370068	25 kohms LIN
R33	5010041	5.6 kohms ±5% 1/8W	R222	5010048	4.7 kohms ±5% 1/8W
R34	5370061	50 kohms LIN	R224	5010052	6.8 kohms ±5% 1/8W
R35	5010135	18 kohms ±5% 1/8W	R225	5010053	15 kohms ±5% 1/8W
R36	5370074	10 kohms LIN	R226	5010046	12 kohms ±5% 1/8W
R37	5010041	5.6 kohms ±5% 1/8W	R227	5370061	50 kohms LIN
R38	5010062	68 kohms ±5% 1/8W	R228	5010059	10 kohms ±5% 1/8W
R39	5010079	22 kohms ±5% 1/8W	R229	5010059	10 kohms ±5% 1/8W
R41	5010054	1 Mohms ±5% 1/8W	R230	5010040	1 kohms ±5% 1/8W
R42	5010047	120 kohms ±5% 1/8W	R231	5010069	3.9 kohms ±5% 1/8W
R43	5010053	15 kohms ±5% 1/8W	R240	5010048	4.7 kohms ±5% 1/8W
R44	5010045	47 kohms ±5% 1/8W			

C1	4200099	100 µF 16V	C202	4130107	100 nF ±10% 250V
C2	4200099	100 µF 16V	C203	4200109	470 µF 6V
C3	4130107	100 nF ±10% 250V	C204	4130195	22 nF ±5% 250V
C4	4130114	470 nF ±10% 100V	C205	4201035	2.2 µF -10+50% 63V
C5	4130114	470 nF ±10% 100V	C206	4130109	10 nF ±10% 250V
C6	4100141	2.7 nF ±5% 630V	C207	4010027	1 nF ±10% 100V
C7	4010041	10 nF -20+80% 40V	C210	4010081	270 pF ±10% 100V
C8	4200342	10 µF -10+50% 63V	C211	4340003	5.5-6.5 pF
C9	4130155	1 µF ±10% 100V	C230	4130109	10 nF ±10% 250V
C201	4010062	330 pF ±10% 100V			

L201	8022101	10 mH			
P8	7220124	Plug 9/8 pins	P12	7220128	Plug 6/5 pins
P9	7210227	Socket 7 pins	P13	7210227	Socket 7 pins
P11	7220122	Plug 4/3 pins	P14	7210226	Socket 6 pins
RL1	7600052	Relay 6V			
T1	8020388	Osc.			
	3304017	Screen for L201			

Power Supply, 8004194, PC4

R1	5010041	5.6 kohms ±5% 1/8W	R27	5010247	1.5 kohms ±5% 1/8W
R2	5010059	10 kohms ±5% 1/8W	R28	5010298	2.7 kohms ±5% 1/8W
R4	5010059	10 kohms ±5% 1/8W	R29	5010049	100 kohms ±5% 1/8W
R5	5010048	4.7 kohms ±5% 1/8W	R30	5010059	10 kohms ±5% 1/8W
R7	5010059	10 kohms ±5% 1/8W	R31	5001035	2.7 kohms ±10% 1/2W
R8	5001027	820 ohms ±10% 1/2W	R32	5010053	15 kohms ±5% 1/8W
R10	5010059	10 kohms ±5% 1/8W	R33	5010048	4.7 kohms ±5% 1/8W
R11	5010046	12 kohms ±5% 1/8W	R34	5001011	82 ohms ±10% 1/2W
R12	5010059	10 kohms ±5% 1/8W	R35	5010040	1 kohms ±5% 1/8W
R13	5010053	15 kohms ±5% 1/8W	R42	5010053	15 kohms ±5% 1/8W
R14	5010067	560 ohms ±5% 1/8W	R43	5010061	56 kohms ±5% 1/8W
R16	5001010	68 ohms ±10% 1/2W	R45	5010040	1 kohms ±5% 1/8W
R17	5010144	680 ohms ±5% 1/8W	R46	5001011	82 ohms ±10% 1/2W
R18	5010065	100 ohms ±5% 1/8W	R47	5010053	15 kohms ±5% 1/8W
R19	5010000	270 ohms ±5% 1/8W	R48	5010048	4.7 kohms ±5% 1/8W
R20	5010058	470 ohms ±5% 1/8W	R49	5010000	270 ohms ±5% 1/8W
R21	5370059	220 ohms ±20% 0.1W LIN.	R51	5010040	1 kohms ±5% 1/8W
R22	5010044	330 ohms ±5% 1/8W	R52	5010040	1 kohms ±5% 1/8W
R26	5010154	8.2 kohms ±5% 1/8W			

C1	4010060	22 nF -20+80% 40V	C6	4130089	22 nF ±10% 250V
C4	4200342	10 µF -10+50% 63V	C8	4200092	47 µF 16C

F1	6600000	250 mA-T/250V S IEC 127		7200038	Holder for Fuse

P1	7220183	Plug 17/16 pins	P5	7210256	Socket 8/7 pins
P2	7210231	Socket 6 pins	P6	7210232	Socket 7 pins
P3	7210232	Socket 7 pins	P7	7210234	Socket 6/5 pins
P4	7210230	Socket 4 pins			
	2819154	Ground spring			

Power Unit, 3358132, PC5

R1	5001164	3.3 ohms ±10% 1/2W

C1	4130150	100 nF ±20% 100V	C4	4130179	100 nF ±20% 63V
C2	4130150	100 nF ±20% 100V	C5	4010060	22 nF -20+80% 40V
C3	4130171	330 nF ±20% 63V			

Rectifier, 8004192, PC6

R1	5010247	1.5 kohms ±5% 1/8W	R2	5010059	10 kohms ±5% 1/8W

C1	4200388	1000 µF 35V	C5	4130107	100 nF ±10% 250V
C2	4200388	1000 µF 35V	C6	4130107	100 nF ±10% 250V
C3	4200410	5000 µF -10+15%	C7	4130107	100 nF ±10% 250V
C4	4130114	470 nF ±10% 100V	C8	4130107	100 nF ±10% 250V

Mic and Input Amplifier 2548162, PC8

R1	5010079	22 kohms ±5% 1/8W	R206	5010665	1.2 Mohms ±5% 1/8W
R201	5010049	100 kohms ±5% 1/8W	R207	5010054	1 Mohms ±5% 1/8W
R202	5010053	15 kohms ±5% 1/8W	R208	5010362	180 ohms ±5% 1/8W
R203	5010052	6.8 kohms ±5% 1/8W	R209	5010054	1 Mohms ±5% 1/8W
R204	5010059	10 kohms ±5% 1/8W	R210	5010078	470 kohms ±5% 1/8W
R205	5010060	39 kohms ±5% 1/8W			

C1	4200092	47 µF 16V	C3	4010041	10 nF -20+80% 40V
C2	4010041	10 nF -20+80% 40V			

C201	4130171	330 nF ±20% 63V	C203	4200423	2.2 µF ±20% 50V
C202	4200423	2.2 µF ±20% 50V	C204	4010027	1 nF ±10% 100V

S1	7400199		S2	7400200	DIN LINE
	7500075	Ground spring			

Transformer, 8013210

09F1	6600042	630 mA, type 4831, 4833, 4841, 4843		6600041	315 mA, type 4834, 4835 4836, 4844, 4845, 4846
	6600033	500 mA, type 4832, 4842		6600026	700 mA, type 4837, 4847

Beocord 8002 Rec. Dolby NR 8004233, PC2

R2	5010049	100 kohms ±5% 1/8W	R216	5010059	10 kohms ±5% 1/8W
R3	5010362	180 ohms ±5% 1/8W	R217	5020145	8.66 kohms 1% 1/8W
R4	5010848	3.3 Mohms ±5% 1/8W	R218	5010053	15 kohms ±5% 1/8W
R7	5010073	390 kohms ±5% 1/8W	R219	5010638	10 Mohms ±10% 1/8W
R8	5010079	22 kohms ±5% 1/8W	R221	5010048	4.7 kohms ±5% 1/8W
R9	5010059	10 kohms ±5% 1/8W	R222	5010066	1.8 kohms ±5% 1/8W
R12	5010742	47 ohms ±5% 1/8W	R223	5010411	47 ohms ±5% 1/8W
R13	5010141	27 kohms ±5% 1/8W	R224	5010053	15 kohms ±5% 1/8W
R14	5010062	68 kohms ±5% 1/8W	R225	5010045	47 kohms ±5% 1/8W
R15	5310091	2 x 22 kohms Log	R226	5010064	2.2 kohms ±5% 1/8W
R201	5010069	3.9 kohms ±5% 1/8W	R229	5010061	56 kohms ±5% 1/8W
R202	5010059	10 kohms ±5% 1/8W	R230	5010041	5.6 kohms ±5% 1/8W
R203	5310105	22 kohms Log paired	R231	5010069	3.9 kohms ±5% 1/8W
R204	5010265	3.3 kohms ±2% 1/4W	R233	5010065	100 ohms ±5% 1/8W
R206	5010045	47 kohms ±5% 1/8W	R234	5010298	2.7 kohms ±5% 1/8W
R207	5010063	150 kohms ±5% 1/8W	R235	5010506	10 ohms ±5% 1/8W
R208	5010117	330 kohms ±5% 1/8W	R236	5001008	47 ohms ±10% 1/2W
R209	5010083	270 kohms ±5% 1/8W	R238	5010066	1.8 kohms ±5% 1/8W
R210	5010059	10 kohms ±5% 1/8W	R239	5010053	15 kohms ±5% 1/8W
R213	5010247	1.5 kohms ±5% 1/8W	R240	5010049	100 kohms ±5% 1/8W
R214	5010059	10 kohms ±5% 1/8W	R241	5010061	56 kohms ±5% 1/8W
R215	5370074	10 kohms LIN			

C2	4201065	10 µF 63V	C213	4130107	100 nF ±10% 250V
C3	4130107	0.1 µF ±10% 250V	C214	4130106	330 nF ±20% 100V
C4	4200100	22 µF 40V	C215	4130050	6.8 nF ±10% 250V
C8	4130107	0.1 µF ±10% 250V	C216	4130114	0.47 µF ±10% 100V
C9	4130107	0.1 µF ±10% 250V	C217	4130195	22 nF ±5% 250V
C10	4130107	0.1 µF ±10% 250V	C218	4130142	220 nF ±5% 100V
C201	4200423	2.2 µF ±20% 50V	C219	4200342	10 µF -10+50% 63V
C202	4200099	100 µF 16V	C220	4200342	10 µF -10+50% 63V
C203	4010027	1 nF ±10% 100V	C221	4200342	10 µF -10+50% 63V
C204	4010027	1 nF ±10% 100V	C223	4010041	10 nF -20+80% 40V
C206	4130194	33 nF ±5% 250V	C225	4010062	330 pF ±10% 100V
C207	4010027	1 nF ±10% 100V	C226	4000023	150 pF ±5% 63V
C208	4100031	4.7 nF ±1% 63V	C227	4000071	270 pF ±5% 63V
C209	4200342	10 µF -10+50% 63V	C228	4010061	2.2 nF ±10% 63V
C210	4130087	47 nF ±10% 250V	C229	4010062	330 pF ±10% 100V
C212	4200342	10 µF -10+50% 63V	C230	4010063	4.7 nF ±10% 63V

L201	8022059	2.8 mH		3304017	Screen for L201
L202	8022111	10 mH			

P10	7220166	Plug 3 pins
P18	7220202	Plug 5 pins

RL1	7600065	Relay 6V

S1	7400200	2 pol

	3358150	Heat sink

Play back, 8004239, PC3

R1	5010742	47 ohms ±5% 1/8W	R54	5010049	100 kohms ±5% 1/8W
R2	5010742	47 ohms ±5% 1/8W	R55	5010045	47 kohms ±5% 1/8W
R3	5010041	5.6 kohms ±5% 1/8W	R56	5010045	47 kohms ±5% 1/8W
R4	5010069	3.9 kohms ±5% 1/8W	R47	5010062	68 kohms ±5% 1/8W
R5	5010045	47 kohms ±5% 1/8W	R58	5010045	47 kohms ±5% 1/8W
R6	5010044	330 ohms ±5% 1/8W	R59	5010120	220 kohms ±5% 1/8W
R7	5010059	10 kohms ±5% 1/8W	R60	5010091	82 kohms ±5% 1/8W
R8	5010059	10 kohms ±5% 1/8W	R61	5010059	10 kohms ±5% 1/8W
R9	5010298	2.7 kohms ±5% 1/8W	R62	5010045	47 kohms ±5% 1/8W
R10	5010059	10 kohms ±5% 1/8W	R63	5010045	47 kohms ±5% 1/8W
R11	5010059	10 kohms ±5% 1/8W	R64	5010046	12 kohms ±5% 1/8W
R12	5010049	100 kohms ±5% 1/8W	R201	5010054	1 Mohms ±5% 1/8W
R13	5010073	390 kohms ±5% 1/8W	R202	5010151	56 ohms ±5% 1/8W
R14	5010059	10 kohms ±5% 1/8W	R203	5010056	82 ohms ±5% 1/8W
R15	5010049	100 kohms ±5% 1/8W	R204	5010151	56 ohms ±5% 1/8W
R16	5010059	10 kohms ±5% 1/8W	R205	5010040	1 kohms ±5% 1/8W
R17	5010040	1 kohms ±5% 1/8W	R206	5010052	6.8 kohms ±5% 1/8W
R18	5010062	68 kohms ±5% 1/8W	R207	5010048	4.7 kohms ±5% 1/8W
R20	5010045	47 kohms ±5% 1/8W	R208	5010063	150 kohms ±5% 1/8W
R21	5010046	12 kohms ±5% 1/8W	R209	5010733	5.1 kohms ±5% 1/8W
R22	5010049	100 kohms ±5% 1/8W	R210	5010062	68 kohms ±5% 1/8W
R23	5010079	22 kohms ±5% 1/8W	R212	5010076	3.3 kohms ±5% 1/8W
R24	5010075	33 kohms ±5% 1/8W	R213	5010064	2.2 kohms ±5% 1/8W
R25	5010075	33 kohms ±5% 1/8W	R214	5010069	3.9 kohms ±5% 1/8W
R26	5010054	1 Mohms ±5% 1/8W	R215	5010041	5.6 kohms ±5% 1/8W
R27	5010049	100 kohms ±5% 1/8W	R216	5370061	50 kohms LIN (play level)
R28	5010064	2.2 kohms ±5% 1/8W	R217	5010064	2.2 kohms ±5% 1/8W
R30	5010054	1 Mohms ±5% 1/8W	R220	5010076	3.3 kohms ±5% 1/8W
R31	5010047	120 kohms ±5% 1/8W	R221	5010041	5.6 kohms ±5% 1/8W
R32	5010053	15 kohms ±5% 1/8W	R222	5010076	3.3 kohms ±5% 1/8W
R33	5010073	390 kohms ±5% 1/8W	R223	5010041	5.6 kohms ±5% 1/8W
R34	5010141	27 kohms ±5% 1/8W	R224	5370061	50 kohms ±5% 1/8W
R35	5010120	220 kohms ±5% 1/8W	R230	5010053	15 kohms ±5% 1/8W
R36	5010069	3.9 kohms ±5% 1/8W	R231	5370068	25 kohms LIN Rec- current
R37	5010154	8.2 kohms ±5% 1/8W	R232	5010048	4.7 kohms ±5% 1/8W
R38	5370074	10 kohms LIN (Fe bias)	R233	5010052	6.8 kohms ±5% 1/8W
R39	5010046	12 kohms ±5% 1/8W	R234	5010048	4.7 kohms ±5% 1/8W
R40	5370068	25 kohms LIN (Mp bias)	R235	5010046	12 kohms ±5% 1/8W
R41	5010049	100 kohms ±5% 1/8W	R236	5010053	15 kohms ±5% 1/8W
R42	5010049	100 kohms ±5% 1/8W	R237	5010053	15 kohms ±5% 1/8W
R43	5010079	22 kohms ±5% 1/8W	R240	5010046	12 kohms ±5% 1/8W
R44	5010049	100 kohms ±5% 1/8W	R241	5370061	50 kohms LIN output level
R45	5010049	100 kohms ±5% 1/8W	R242	5010059	10 kohms ±5% 1/8W
R46	5010060	39 kohms ±5% 1/8W	R243	5010069	3.9 kohms ±5% 1/8W
R47	5010049	100 kohms ±5% 1/8W	R244	5010059	10 kohms ±5% 1/8W
R49	5010245	2.2 Mohms ±10% 1/8W	R245	5010040	1 kohms ±5% 1/8W
R50	5010054	1 Mohms ±5% 1/8W	R249	5010063	150 kohms ±5% 1/8W
R51	5010141	27 kohms ±5% 1/8W	R251	5010052	6.8 kohms ±5% 1/8W
R52	5010075	33 kohms ±5% 1/8W	R252	5010040	1 kohms ±5% 1/8W
R53	5010049	100 kohms ±5% 1/8W	R253	5010092	220 ohms ±5% 1/8W

C1	4200099	100 µF 16V	C206	4201035	2.2 µF -10+50% 63V
C2	4200099	100 µF 16V	C207	4130109	10 nF ±10% 250V
C3	4200423	2.2 µF ±20% 50V	C210	4000132	68 pF ±5% 250V
C4	4130179	100 nF ±20% 63V	C211	4101031	270 pF ±5% 63V
C201	4010027	1 nF ±10% 100V	C212	4130195	22 nF ±5% 250V
C202	4010062	330 pF ±10% 100V	C213	4130179	100 nF ±20% 63V
C203	4130107	100 nF ±10% 250V	C214	4101019	1 nF ±5% 63V
C204	4200109	470 µF 6V	C215	4101002	100 pF ±5% 63V
C205	4130195	22 nF ±5% 250V			

L201	8022104	10.6 µH	L203	8022123	Bias
L202	8022111	10 mH		3304017	Screen for L203

P8	7220124	Plug 9/8 pins	P13	7210227	Socket 7 pins
P9	7210227	Socket 7 pins	P14	7210226	Socket 6 pins
P11	7220122	Plug 4/3 pins	P27	7220128	Plug 6/5 pins
P12	7220128	Plug 6/5 pins			

RL1	7600052	Relay 6V

S1	7400233

Bias Osc. 8004237, PC13

R1	5010742	47 ohms ±5% 1/8W	R201	5010073	390 kohms ±5% 1/8W
R2	5011019	330 ohms ±5% 1/4W	R202	5010040	1 kohms ±5% 1/8W
R3	5011019	330 ohms ±5% 1/4W	R203	5010049	100 kohms ±5% 1/8W
R4	5010059	10 kohms ±5% 1/8W	R204	5010048	4.7 kohms ±5% 1/8W
R5	5010059	10 kohms ±5% 1/8W	R205	5010048	kohms ±5% 1/8W
R6	5010054	1 Mohms ±5% 1/8W			

C1	4130150	0.1 µF ±20% 100V	C7	4010072	10 nF -20+100% 40V
C2	4130150	0.1 µF ±20% 100V	C8	4100141	2.7 nF ±5% 630V
C3	4200342	10 µF -10+50% 63V	C201	4101002	100 pF ±5% 63V
C4	4130150	100 nF ±20% 100V	C202	4130081	10 nF ±20% 250V
C5	4130114	470 nF ±10% 100V	C203	4010072	10 nF -20+100% 40V
C6	4130114	470 nF ±10% 100V	C204	4130087	47 nF ±10% 250V

P25	7220130	Plug 8/7 pins
P26	7220115	Plug 7/6 pins

T1	8020338

Other parts as Beocord 6000

LIST OF MECHANICAL PARTS
Beocord 6000

004	2560094	Profile
005	3164359	Lid
006	2015090	Screw 3.5 x 6.5 black
007	2015090	Screw 3.5 x 6.5 black
008	2530361	Bracket
009	3110031	Cabinet, teak
	3110033	Cabinet, rosewood
	3110034	Cabinet, oak
	3110035	Cabinet, white
0010	2390020	Plastic washer
0011	2622015	Washer
0012	6273864	Chassis lead
0013	2039905	Screw AM3 x 12
0014	3150045	Clamp
0015	3322057	Window
0016	3132050	Housing
0017	3199057	Dial
0020	2570063	Arm
0021	3130061	Damping system
0022	2013095	Screw 2.9 x 9.5 black
0023	2380122	Nut M4
0024	2043017	Screw M4 x 25 black
0025	2905080	Hinge
0026	2830071	Pin
0027	2391052	Lock
0028	2034046	Screw AM2 x 8
0029	2015090	Screw 3.5 x 6.5 black
0030	2819146	Spring
0031	2530361	Bracket
0032	2775726	Button
0033	2812084	Spring
0034	2013094	Screw 2.9 x 6.5 black
0035	2572024	Rail
0036	3164362	Lid
0037	2013094	Screw 2.9 x 6.5 black
0038	2905080	Hinge
0039	3164360	Panel
0040	3164403	Cover, complete
0041	2775710	Button
0042	3170178	Foil
0043	3162129	Lid
0044	2380122	Nut M4
0045	2390020	Plastic washer
0046	2043017	Screw M4 x 25 black
0047	2622015	Washer
0048	2039905	Screw AM3 x 12
0049	2775709	Button

01Modul	8004195	PC, microcomputer	01P2	6200032	Interconnecting cable
0101	3950009	Rubber bushing	01P7	6200033	Interconnecting cable
0102	3152273	Holder	01P19	6275447	Lead with socket

02Modul	8004262	PC, record/dolby	02P13	6200034	Interconnecting cable
02P9	6200034	Interconnecting cable	02P14	6200035	Interconnecting cable

07Modul	3168153	Operating unit, complete	0704	7500148	Contact spring
0701	3168109	Operating panel	0705	8004227	PC, keyboard
0702	2775872	Set of buttons, small	0706	2775873	Set of buttons, big

10Modul	8004217	PC, clock set
1001	7500148	Contact spring

Beocord 8002

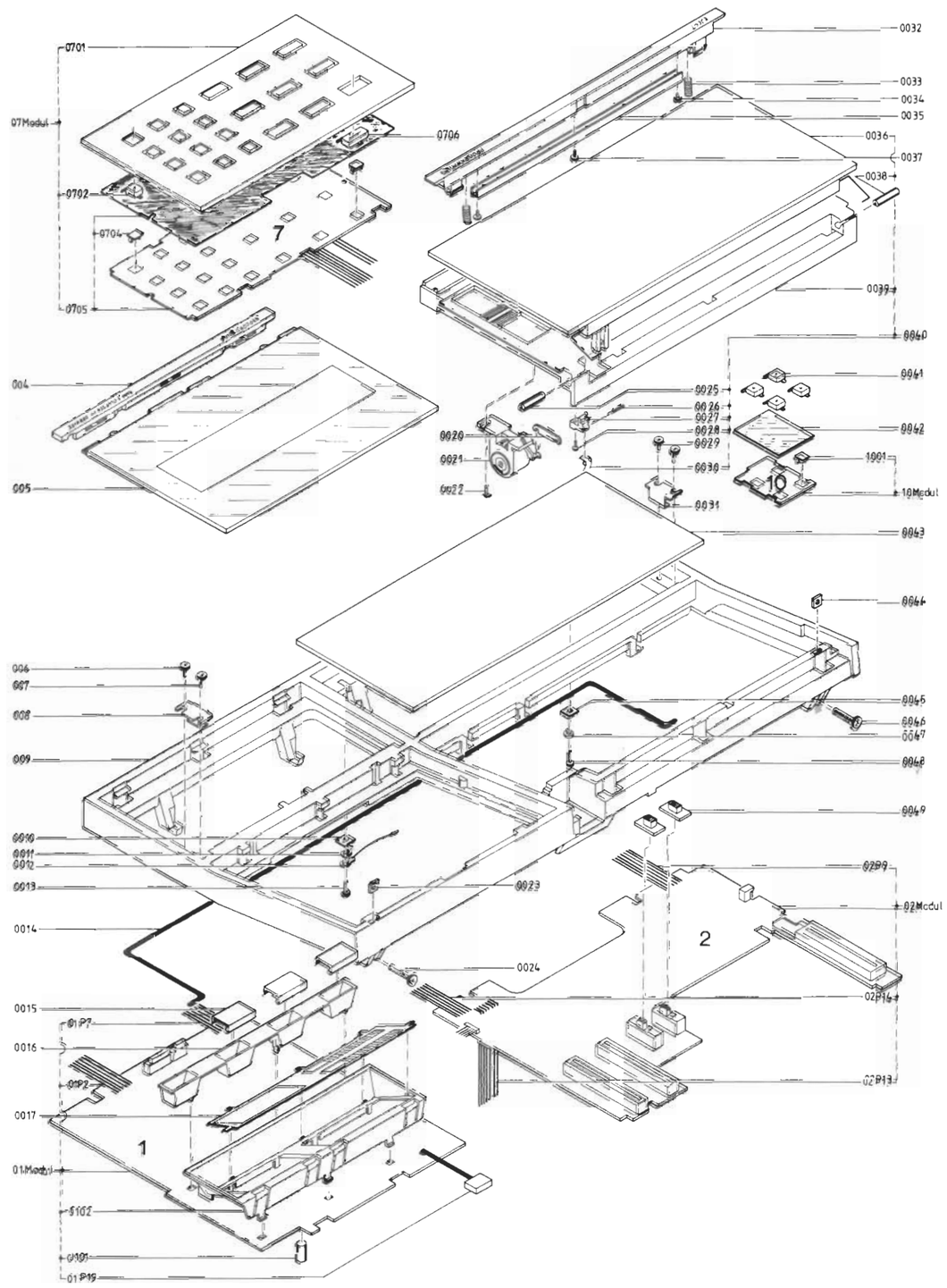
004	2560086	Profile	0042	3170193	Foil
0036	3164433	Lid		2622329	Fibre washer
0039	3164417	Panel		2039043	Screw AM3 x 4
0040	3164443	Cover, complete			

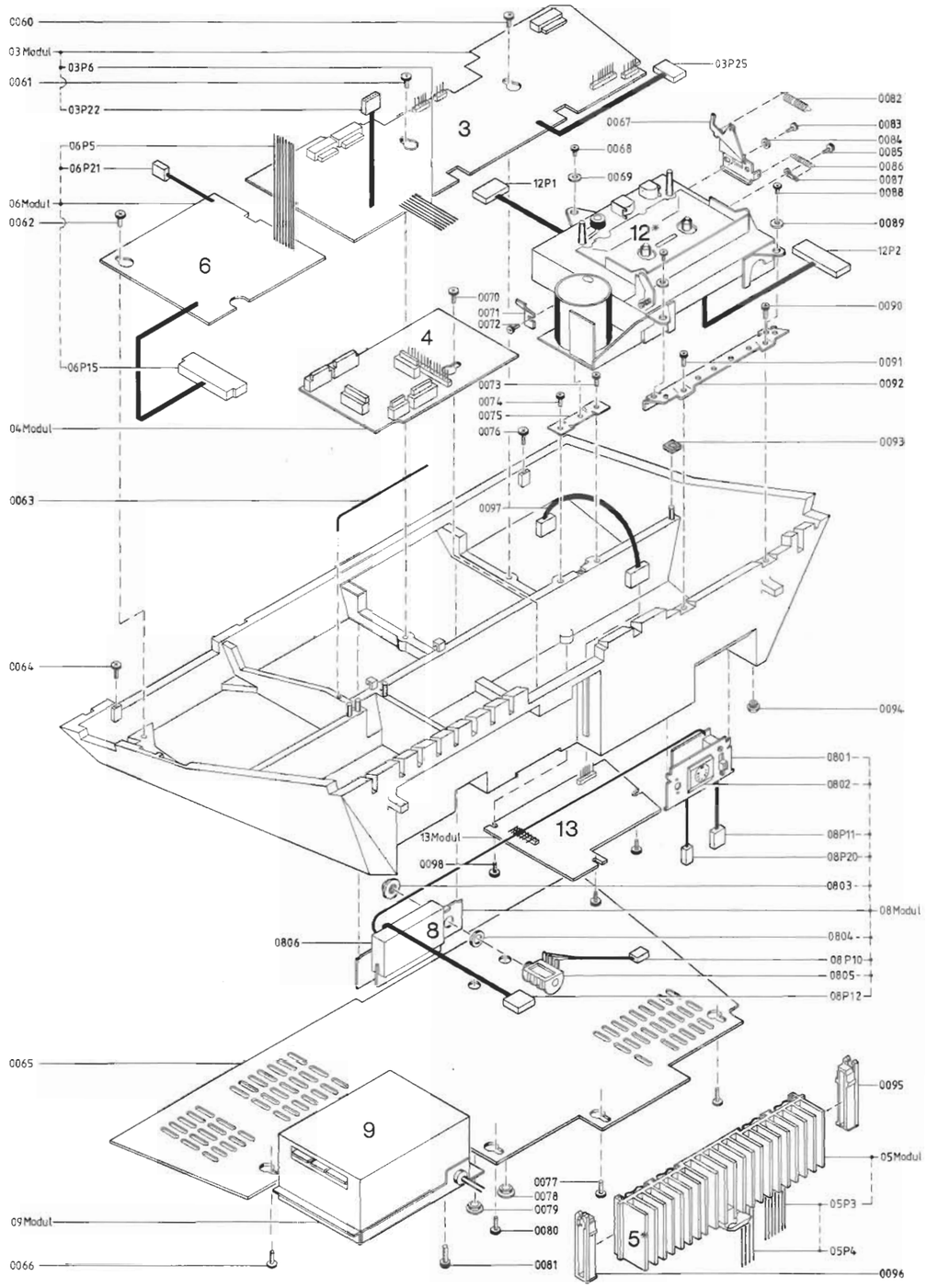
02Modul	8004233	PC, record/dolby

07Modul	2568554	Operating unit, complete	0706	2775725	Set of buttons, big
0702	2775724	Set of buttons, small			

10Modul	8004235	PC, clock set

Other parts as Beocord 6000.





Beocord 6000

0060	2015090	Screw 3.5 x 6.5 black	0079	2938163	Bushing
0061	2015090	Screw 3.5 x 6.5 black	0080	2015091	Screw 3.5 x 9.5 black
0062	2015090	Screw 3.5 x 6.5 black	0081	2043016	Screw AM4 x 10 black
0063	2819152	Spring	0082	2810069	Spring
0064	2015090	Screw 3.5 x 6.5 black	0083	2039044	Screw M3 x 5
0065	3454250	Bottom plate	0084	2622247	Washer
0066	2015091	Screw 3.5 x 9.5 black	0085	2039044	Screw M3 x 5
0067	2854074	Arm	0086	2810069	Spring
0068	2039027	Screw AM3 x 6 black	0087	7530005	Solder tag
0069	2622247	Washer	0088	2039027	Screw AM3 x 6 black
0070	2015090	Screw 3.5 x 6.5 black	0089	2622247	Washer
0071	2548170	Bracket	0090	2015202	Screw 3.5 x 13 black
0072	2039044	Screw M3 x 5	0091	2015202	Screw 3.5 x 13 black
0073	2015202	Screw 3.5 x 13 black	0092	2530358	Bracket
0074	2015202	Screw 3.5 x 13 black	0093	3010010	Lead holder
0075	2530359	Bracket	0094	3035026	Rubber foot
0076	2015090	Screw 3.5 x 6.5 black	0095	3152271	Holder
0077	2015091	Screw 3.5 x 9.5 black	0096	3152271	Holder
0078	2938163	Bushing			

03Modul	8004261	PC, bias/replay
03P6	6273867	Interconnecting cable

04Modul	8004194	PC, power supply/control

05Modul	3358132	Heat sink complete
05P3	6273860	Set of interconnecting cables
05P4	6273860	Set of interconnecting cables

06Modul	8004192	PC, Power supply	06P15	6275452	Lead w/socket
06P5	6200031	Interconnecting cable	06P21	6275446	Lead w/socket

08Modul	2548162	Socket panel complete	0806	3302311	Screen
0801	3122093	Bracket	08P10	6273920	Lead w/socket
0802	7210269	Socket 7-contact DIN	08P11	6273921	Lead w/socket
0803	2389045	Nut	08P12	6273861	Lead w/socket
0804	2622308	Fibre washer	08P20	6273922	Lead w/socket
0805	7210224	Jack-socket			

09Modul	8013211	Transformer 114V, type 4841, 4831	8013215	Transformer 240V, type 4845, 4835
	8013212	Transformer 120V, type 4842, 4832, USA	8013216	Transformer 240V, type 4846, 4836, AUS
	8013213	Transformer 127V, type 4843, 4833	8013247	Transformer 105V, type 4847, 4837, JAP
	8013214	Transformer 220V, type 4844, 4834		

12P1	6275440	Set of leads w/socket
12P2	6275441	Set of leads w/socket
	3152214	Cable binder

Beocord 8002

0065	3454284	Bottom plate
0097	6273985	Lead w/socket
0098	2015090	Screw 3.5 x 6.5 black

03Modul	8004239	PC, replay
03P6	6200039	Interconnecting cable
03P22	6274014	Lead w/socket
03P25	6274015	Lead w/socket

12P1	6275477	Set of leads w/socket
12P2	6275478	Set of leads w/socket

13Modul	8004237	PC, bias

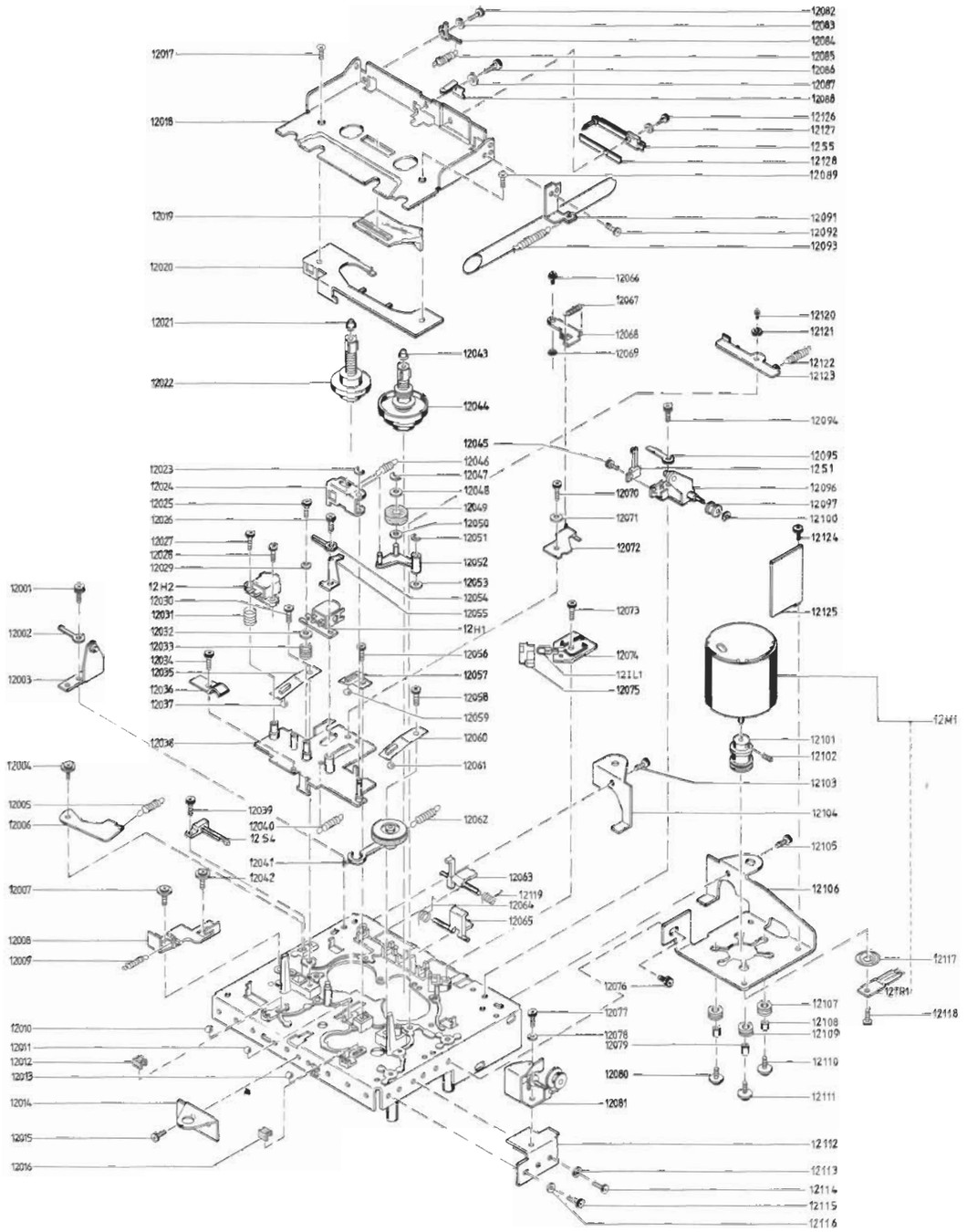
Other parts as Beocord 6000

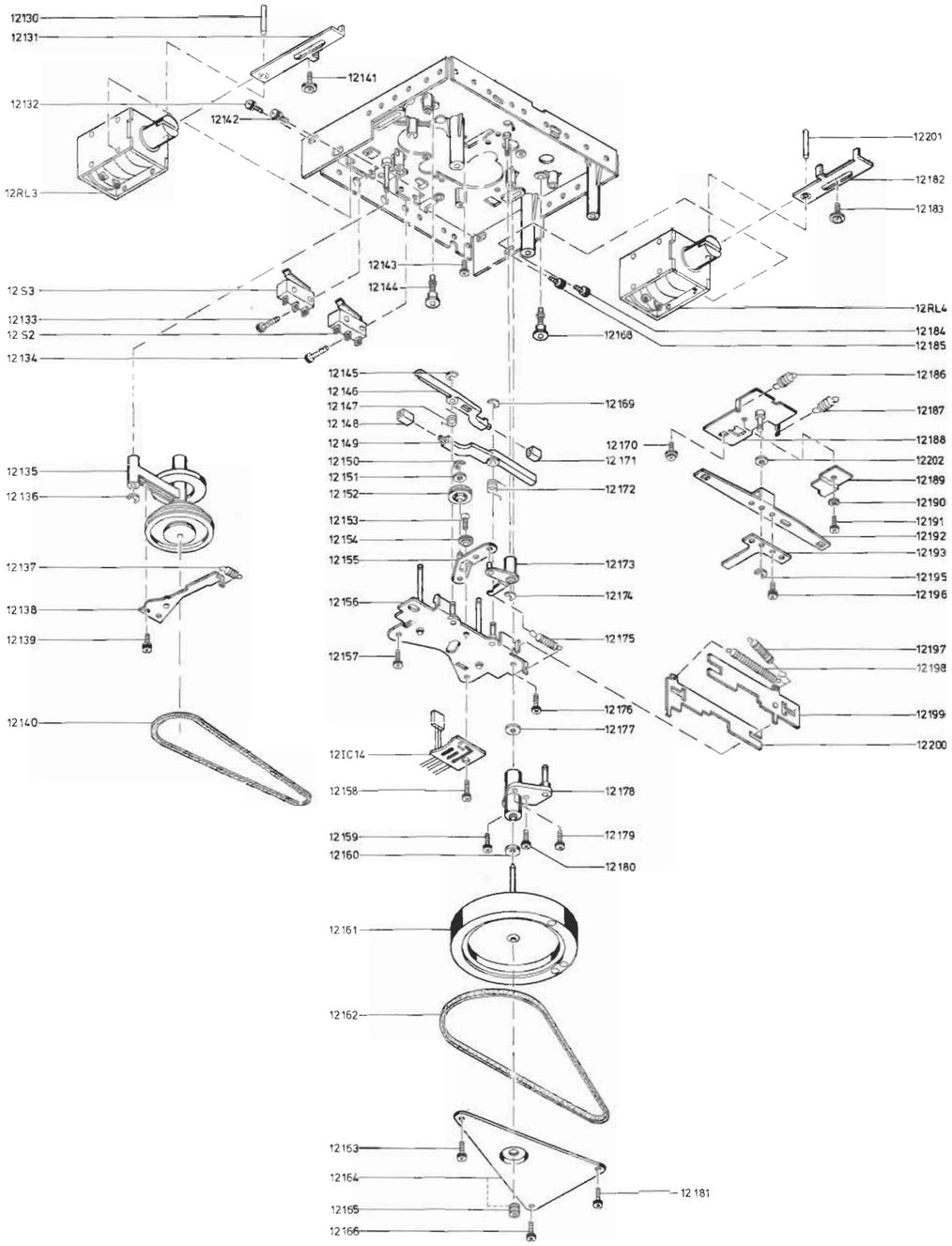
Tape Deck
Beocord 6000

12001	2036017	Screw M2.6 × 4	12062	2810104	Spring
12002	7530088	Solder tag	12063	2853062	Sensor
12003	2530382	Bracket	12064	2818062	Spring
12004	2036030	Screw 2.6 × 8	12065	2853061	Sensor
12005	2810110	Spring	12066	2036023	Screw 2.6 × 7
12006	2530377	Bracket	12067	2810113	Spring
12007	2036028	Screw 2.6 × 6	12068	2853068	Arm
12008	2542534	Bracket	12069	2932093	Bushing
12009	2810101	Spring	12070	2036021	Screw M2.6 × 3
12010	2917018	Ball 2.5	12071	2624045	Washer
12011	2917018	Ball 2.5	12072	2542538	Bracket
* 12012	3010017	Stop	12073	2036029	Screw 2.6 × 8
12013	2917018	Ball 2.5	12074	6140766	Mounting plate
12014	2530380	Bracket	12075	3151189	Lamp housing
12015	2036018	Screw M2.6 × 5	12076	2036022	Screw M2.6 × 5
* 12016	3010017	Stop	12077	2036022	Screw M2.6 x 5
12017	2034047	Screw M2 × 4 black	12078	2624045	Washer
12018	3151190	Holder	12079	2932089	Brass bushing
12019	3199058	Light conductor	12080	2036023	Screw M2.6 × 7
12020	3151188	Bracket	12081	2542506	Damping system
12021	3164380	Cover	12082	2036019	Screw M2.6 × 3 black
12022	2932092	Supply reel	12083	2624045	Screw
12023	2390078	E-ring 2	12084	2548172	Bracket
12024	2853063	Arm	12085	2810103	Spring
12025	2034048	Screw M2 × 5	12086	2034052	Screw M2 × 2 black
12026	2034049	Screw M2 × 4	12087	2622298	Washer
12027	2034050	Screw M2 × 7	12088	2816178	Leaf spring
12028	2034207	Screw M2 × 5	12089	2034047	Screw M2 × 4 black
12029	2622300	Washer	12091	2530379	Bracket
12030	2036029	Screw 2.6 × 8	12092	2034052	Screw M2 × 2 black
12031	2812087	Spring	12093	2810100	Spring and cord
12032	2622294	Washer	12094	2036017	Screw M2.6 × 4
12033	2812088	Spring	12095	7530088	Solder tag
12034	2036019	Screw M2.6 × 3 black	12096	2542536	Holder
12035	2816175	Leaf spring	12097	2932088	Cord pulley
12036	3151191	Wire holder	12100	2390056	E-ring 1.5
12037	2917018	Ball 2.5	12101	2722027	Pulley
12038	3112244	Chassis	12102	2072008	Threaded pin
12039	2034051	Screw 2 × 8	12103	2036021	Screw M2.6 × 3
12040	2810108	Spring	12104	2542535	Bracket
12041	2804039	Arm	12105	2036021	Screw M2.6 × 3
12042	2036028	Screw 2.6 × 6	12106	2542537	Bracket
12043	3164380	Cover	12107	2932090	Rubber bushing
12044	2932091	Take-up reel	12108	2932089	Brass bushing
12045	2036020	Screw M2.6 × 4	12109	2932090	Rubber bushing
12046	2810109	Spring	12110	2036023	Screw M2.6 × 7
12047	2390078	E-ring 2	12111	2036023	Screw M2.6 × 7
12048	2622297	Washer	12112	2530381	Bracket
12049	2804041	Thrust roller	12113	2624013	Washer
12050	2622297	Washer	12114	2039039	Screw M3 × 4
12051	2390078	E-ring 2	12115	2039039	Screw M3 × 4
12052	2853067	Arm	12116	2624013	Washer
12053	2622297	Washer	12117	2622245	Plastic washer
12054	7530089	Solder tag	12118	2034207	Screw M2 × 5
12055	2816176	Bracket	12119	2818067	Spring
12056	2036029	Screw 2.6 × 8	12120	2034051	Screw 2 x 8
12057	2816177	Leaf spring	12121	2932095	Bushing
12058	2036029	Screw 2.6 × 8	12122	2810128	Spring
12059	2917018	Ball 2.5	12123	2853090	Arm
12060	2816175	Leaf spring	12124	2013099	Screw 2.9 x 6.5
12061	2917018	Ball 2.5	12125	8004224	Noise filter

12H1	8600054	Tape head	12H2	8600055	Erase head
12IL1	8230060	Lamp			
12M1	8400101	Motor			
12S1	7410018	Switch	12S4	7410019	Switch
12TR1	8320429	Transistor			

* Replacing stops 12012/12016 new stops are to be glued with IS 12 (code no. 3980033)





Tape Deck
Beocord 6000

12130	2361055	Pin	12166	2036027	Screw 2.6 × 10
12131	2894046	Arm	12168	2994023	Guide pin
12132	2038063	Screw M3 × 5	12169	2390078	E-ring 2
12133	2036026	Screw M2.3 × 10	12170	2036025	Screw M2.6 × 6.5
12134	2036026	Screw M2.3 × 10	12171	2938161	Brake block
12135	2724059	Clutch	12172	2818066	Spring
12136	2390073	E-ring 2.5	12173	2854077	Arm
12137	2810099	Spring	12174	2390078	E-ring 2
12138	2530378	Bracket	12175	2810102	Spring
12139	2036010	Screw M2.6 × 8	12176	2036027	Screw 2.6 × 10
12140	2732047	Belt	12177	2622296	Plastic washer
12141	2036030	Screw 2.6 × 8	12178	3114148	Bearing
12142	2038063	Screw M3 × 5	12179	2036024	Screw M2.6 × 6
12143	2034051	Screw 2 × 8	12180	2036024	Screw M2.6 × 6
12144	2994023	Guide pin	12181	2036027	Screw 2.6 × 10
12145	2390078	E-ring 2	12182	2894047	Arm
12146	2853065	Arm	12183	2036030	Screw 2.6 × 8
12147	2818065	Spring	12184	2038063	Screw M3 × 5
12148	2938161	Brake block	12185	2038063	Screw M3 × 5
12149	2853064	Arm	12186	2810107	Spring
12150	2390056	E-ring 1.5	12187	2810107	Spring
12151	2622299	Washer	12188	3112248	Bracket
12152	2804040	Wheel	12189	2542539	Bracket
12153	2034053	Screw M2 × 4	12190	2624045	Washer
12154	2932087	Bushing	12191	2036021	Screw M2.6 × 3
12155	2851109	Arm	12192	2853066	Arm
12156	3112246	Chassis	12193	3014049	Arm
12157	2036027	Screw 2.6 × 10	12195	2390073	E-ring 2.5
12158	2036027	Screw 2.6 × 10	12196	2036022	Screw M2.6 × 5
12159	2036024	Screw M2.6 × 6	12197	2810105	Spring
12160	2622295	Plastic washer	12198	2810106	Spring
12161	2794081	Flywheel	12199	3014050	Bracket
12162	2732048	Belt	12200	3014051	Bracket
12163	2036027	Screw 2.6 × 10	12201	2361055	Pin
12164	3112247	Holder	12202	2622322	Washer
12165	2991021	Bearing			

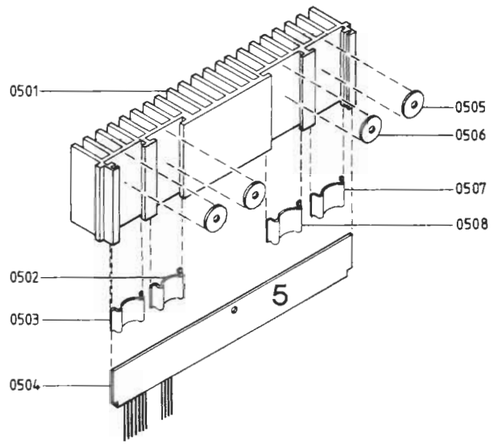
12IC14	8004216	PC complete			
12RL3	6840254	Solenoid	12RL4	6840254	Solenoid
12S2	7410020	Switch	12S3	7410020	Switch

Beocord 8002

12018	3151206	Holder	12126	2036034	Screw 2.6 x 6 black
12088	2816186	Leaf spring	12127	2622298	Washer
12125	8004286	Noise filter	12128	3170204	Insulation
12H1	8600061	Tape head			
12S5	7410025	Switch			

Other parts as Beocord 6000

Heat sink 3358132



0501	3358161	Heat sink w/wire holder	0505	3170157	Mica sheet
0502	2816163	Spring	0506	3170157	Mica sheet
0503	2816163	Spring	0507	2816163	Spring
0504	8004211	PC, Heat sink	0508	2816163	Spring

Parts Not Shown

6271102	Mains lead Euro Plug	3534166	Diagram Beocord 6000
6100012	Mains lead, US	3534163	Diagram Beocord 8002
6270212	Interconnecting cable RCA/DIN	3391558	Outer carton
		3397456	Foam packing, set

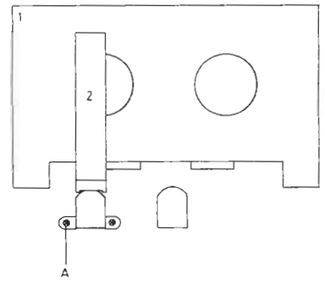
Module packing

Modul nr.	Designation	Emb. nr.
01	Micro-computer	3391576
02	Record/Dolby	3391576
03	Bias/play back	3391575
*03	Play back	3391575
04	Power supply	3391574
05	Heat sink	3391574
06	Rectifier	3391574
07	Keyboard primary	sample bag
08	Input amplifier	3391574
10	Keyboard secondary	sample bag
*13	Bias	3391574

★ Is used in Beocord 8002, only.

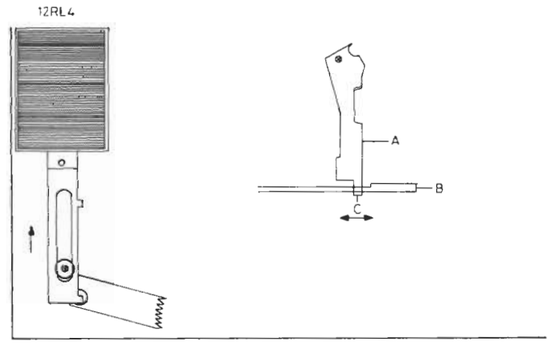
MECHANICAL ADJUSTMENTS

Erase Head Height



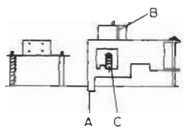
Erase head heights is adjusted with adjustment tools 1 and 2 from adjustment tool kit 3624020.
Place adjustment tools in cassette holder as shown in sketch.
Carefully press tape head bridge in against tool 2.
With screw A adjust until tape guide goes in above tool 2.

Rewind



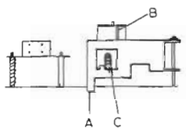
Press armature in magnet coil 12RL4 in as far as it will go.
Clearance between arm A and arm B should then be 0.5 - 1 mm. Adjustment is performed by bending the arm A so that tag C moves in one of the directions of the arrow.

Thrust Roller Free Travel



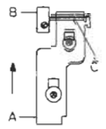
Press tape head bridge as far as it will go. Clearance between pin A on thrust roller arm and tape head bridge should then be approx. 0.5 mm.
Adjustment is performed by bending pin A.

Thrust Roller Thrust



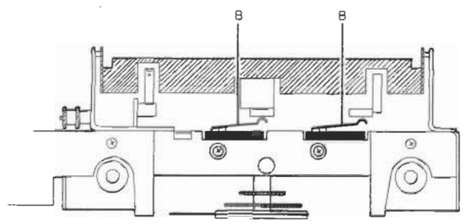
Activate play.
With spring balance at point B pull thrust roller back.
Carefully release thrust roller until it just touches the capstan shaft.
Shift spring C to one of the two notches where the spring balance reading is closest to 300 p.
Example: Spring in right-hand notch gives 280 p and spring in left-hand notch gives 330 p. Since ideal force is 300 p right-hand notch is correct adjustment.

Eject Switch



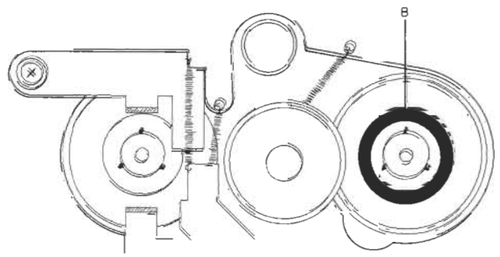
Carefully push arm A in direction of arrow, eject switch B should then open from travel of from 0.5 mm to 2 mm and before the cassette drawer releases mechanically.

Cassette detector
Record lock



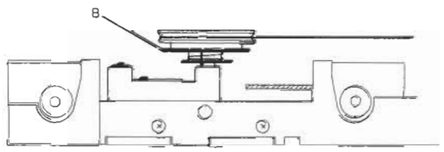
The two switches for cassette detector and record locking are bent back at the points »B« so that the switches change-over reliably when a cassette is inserted, and will change back again when the cassette is removed.

Assembler moment



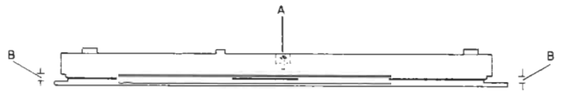
The assembler moment should be within 35/60 p/cm.
Adjustment is made by pressing the ring »B« of the assembler coil all the way down and turn it.

Coil moment



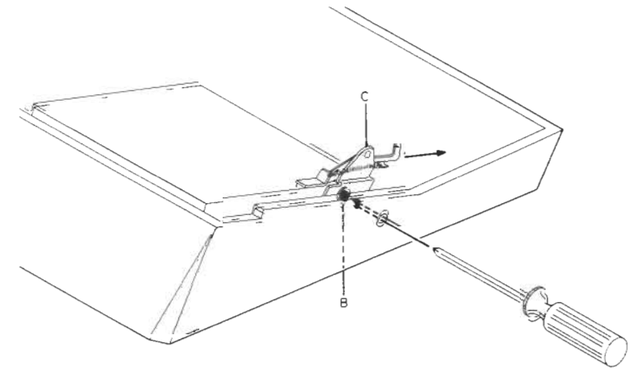
The coil moment is measured by winding forward until just before the auto stop is activeted. The moment should be more than 100 p/cm.
Wind forward until end stop.
Brake to stop the motor pulley with a finger, activate forward winding, release the motor pulley slowly thus allowing the motor to start-up slowly. When the motor runs freely, read off moment. Adjustments are made by turning the disc »B«.

Programming button



Adjust the screw »A« so that the tilting lid is released when the button is pressed (at the PROGRAMMING as well as at the EJECT side) to a distance of approx. 3 mm in the point »B».

Eject



Loosen the screw »B«, move the bracket »C« in the direction of the arrow, tighten screw B.
Close the deck and tighten the screws at the back edge of the deck. Keep PROGRAMMING pressed down while carefully loosen the screw »B« until a faint click is heard.
Tighten screw »B«.

Lubrication

The need for lubrication is negligible, but the directions given below should be followed during overhauls and when replacing major mechanical components.

Bracket 12084: Against spring 12085 Arm 12024: Surfaces of contact against arm 12052. Balls 12037, 12059, 12061: Fase slidings against leaf springs 12035, 12057, 12060, and chassis 12038. Shaft on holder 12096: Surface of contact against pulley 12097. Switch 12S4: Surface of contact against bracket 12008. Bracket 12008: Face sliding against screws 12007, 12042, and chassis 12038. Balls 12010, 12011, 12013: Face slidings against chassis 12038, and top chassis. Chassis 12038: Surface of contact against top chassis. Sensor 12065: Shaft both sides. Arms 12131, 12182: Face slidings against taps in top chassis Pins 12130, 12201: Face slidings against top chassis. Arm 12173: Surface of contact against tap in top chassis. Bracket 12188: Face slidings against top chassis 12038, and arms 12192, 12193. Arm 12192: Surfaces of contact against arms 12131, 12182. Arm 12193: Surfaces of contact against arm 12155, and angles 12199, 12200. Arm 12155: Surace of contact against arm 12173, and shaft for idler wheel 12152. Chassis 12156: Shafts for turntables 12022, 12044. Bracket 12199, 12200: All surfaces of contact.	3984022 Floil GB-TS-1
Bracket 12008: Face sliding at screw 12042 Arm 12155: Surface of contact at bushing 12154 Arm 12052: Surface of contact against chassis 12038.	3984216 Molykote (pasta G.)
Bracket 12072: Surface of contact against arm 12041. Damping system 12081: All gear- wheels Bearing 12165: Against flywheel 12161.	3984021 Eprohon Grease

ELEKTRICAL ADJUSTMENTS
Introduction for Beocord 6000

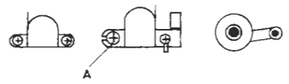
As mentioned in the introduction the LF circuits will later on in production be changed to adjustment according to IEC standard.
Sets in which the two first digits of the serial No. is 21xxxxx are adjusted according to DIN standard. (See below instructions).
Sets in which the two first digits of the serial No is 22xxxxx or higher are adjusted according to IEC standard. (See page 6-3).

DIN Standard

The references apply to the RH channel (the references in brackets apply to the LH channel).
Co-oridnate indication is given after the position numbers.
Make electrical adjustments without DOLBY NR.
The DIN/LINE switch must be set in position LINE.

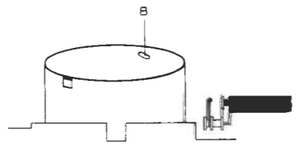
Azimuth

Degauss tape and erase heads.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Load Azimuth tape 6780036.

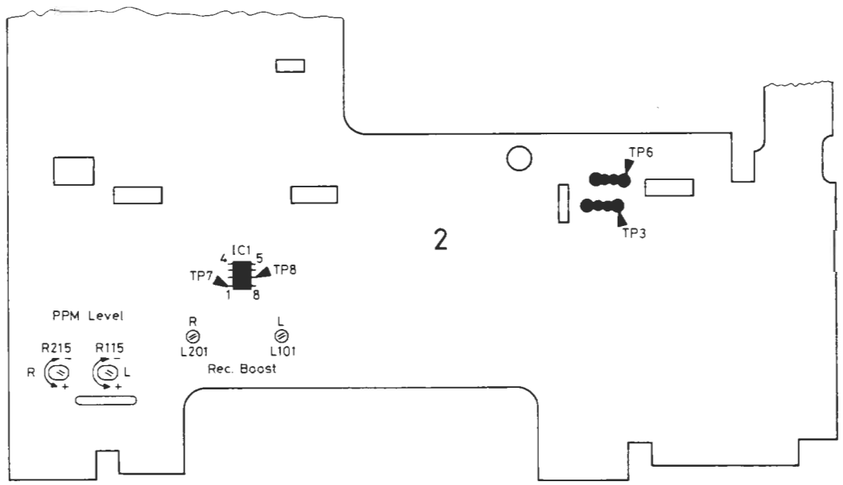


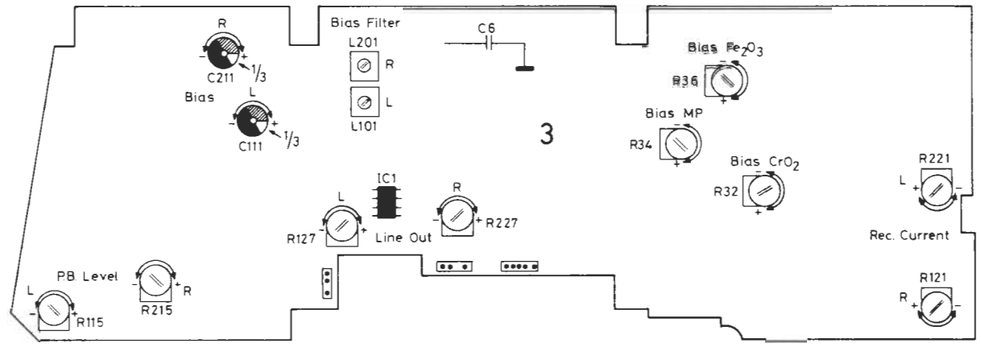
Adjust the screw A to max. in both channels and to equal output for LH and RH channels (mean value 2TP3 (2TP6)).

Speed



Load Wow tape 6780037.
Adjust by means of the motor potentiometer B for correct speed as read on the drift meter of a Wow meter.
Make the adjustment in a mid-tape position.





Play-back Level

Load play-back level tape 6780035.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Adjust $3R215_{C2}$ ($3R115_{C1}$) until a reading of 725 mV is obtained in 2TP3 (2TP6).

Record Boost

Load CrO_2 tape.
Connect a tone generator to the AMPLIFIER input and set it to generate 333 Hz and approx. 50 mV.
Connect AF voltmeter to $2TP7_{D6}$ ($2TP8_{D5}$).
Activate record pause.
Adjust the record potentiometers until a reading of 210 mV is obtained in 2TP7 (2TP8).
Change the tone generator frequency to 10 kHz.
Adjust the $2L201_{D6}$ ($2L101_{D5}$) until 1 V is measured in 2TP7 (2TP8).

PPM

Set a tone generator to generate 333 Hz and approx. 1 V.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Activate record pause.
Adjust the record potentiometers until 725 mV is measured in 2TP3 (2TP6).
Adjust $2R215_{E7}$ ($2R115_{E7}$) until the +2 dB LED is just glowing.

Bias Filter

Connect an AF voltmeter across the tape head.
Activate Record.
Adjust $3L201_{A4}$ ($3L101_{B4}$) until max. voltage is measured across the tape head.

Bias and Record Current CrO_2 (for adjustment)

Load CrO_2 standard test tape 6780040.
Set $3R221_{B8}$ ($3R121_{C8}$) in mid-position and adjust $3C211_{A2}$ ($3C111_{B3}$) until 1/3 of max.
Connect an AC voltmeter across $3C6_{A5}$.
Adjust $3R32_{B7}$ until 56 V is measured across 3C6.

Record Current

Set a tone generator to generator 333 Hz and approx. 200 mV.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$.
Activate record pause.
Adjust the record potentiometers until a reading of 200 mV is obtained in 2TP3 (2TP6).
While recording and playing back respectively, adjust $3R221_{B8}$ ($3R121_{C8}$) until a reading of 200 mV is obtained in 2TP3 (2TP6) during Record as well as Play-back.

Bias

Set a tone generator to generate 333 Hz and approx. 25 mV.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Acitvate record pause.
Adjust the Record potentiometers until a reading of approx. 25 mV is obtained in 2TP3 (2TP6).
While recording and playing back 333 Hz and 15 kHz respectively, adjust $3C211_{A2}$ ($3C111_{B3}$) until the level at 15 kHz is 1 dB higher than the level at 333 Hz. (Less bias will result in treble boost. More bias will result in treble cut).
Check Record current.

Fe_2O_3 Bias

CrO_2 bias **must** be adjusted, and tone generator and Record potentiometers must have the same settings as for CrO_2 bias.
Connect an AF voltmeter to $2TP3_{D3}$.
Load Fe_2O_3 standard test tape 6780043.
While recording and playing back 333 Hz and 15 kHz respectively, adjust $3R36_{A6}$ until the level at 15 kHz is 1 dB higher than the level at 333 Hz.

MP Bias

CrO_2 bias **must** be adjusted and tone generator and Record potentiometers must have the same setting as for CrO_2 bias.
Set the AUTO-MP switch at MP.
Connect an AF voltmeter to $2TP3_{D3}$.
Load MP standard test tape 6780059.
While recording and playing back 333 Hz and 15 kHz respectively, adjust $3R34_{A6}$ until the level at 15 kHz is 1 dB higher than the level at 333 Hz.

ELECTRICAL ADJUSTMENTS for Beocord 6000 IEC Standard

In the main, IEC Standard adjustments of Beocord 6000 correspond to the DIN Standard adjustments, and therefore only the few deviating points are mentioned in the following.

Record Boost

Load CrO_2 tape.
Connect a tone generator to the AMPLIFIER input and set ti to generate 333 Hz and approx. 50 mV.
Connect an AF voltmeter to $2TP7_{D6}$ ($2TP8_{D5}$).
Activate Record pause.
Adjust the Record potentiometers until a reading of 200 mV is measured in 2TP7 (2TP8).
Change the frequency of the tone generator to 15 kHz.
Adjust $2L201_{D6}$ ($2L101_{D5}$) until 2 V is measured in 2TP7 (2TP8).

To adjust to CrO_2 Bias

Load CrO_2 standard test tape 6780066.
Set $3R221_{B8}$ ($3R121_{C8}$) in mid-position and adjust $3C211_{A2}$ ($3C111_{B3}$) until 1/3 of max.
Connect an AC voltmeter across $3C6_{A5}$.
Adjust $3R32_{B7}$ until 52 V is measured across 3C6.

Fe_2O_3 Bias

Use Fe_2O_3 standard test tape 6780067.

Bias Control

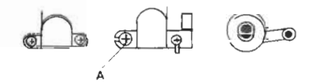
Control of the bias adjustment can be made with DM1 as described under Electrical Adjustments of Beocord 8002.

ELECTRICAL ADJUSTMENTS for Beocord 8002

The references apply to RH channel (the references in brackets apply to LH channel).
Co-oridnate indication is given after the position numbers.
Make electrical adjustments without DOLBY NR. The DIN/LINE switch must be set in position LINE.
The MPX switch must be set in poistion OUT.

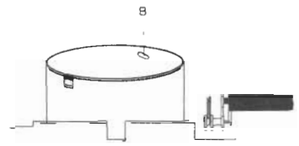
Azimuth

Degauss tape and erase heads.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Load Azimuth tape 6780036.



Adjust the screw A to max. in both channels and to equal output for LH and RH channels (mean value 2TP3 (2TP6)).

Speed



Load Wow tape 6780037.
Adjust by means of the motor potentiometer B for correct speed as read on the drift meter of a Wow meter.
Make the adjustment in a mid-tape position.

Play-back Level

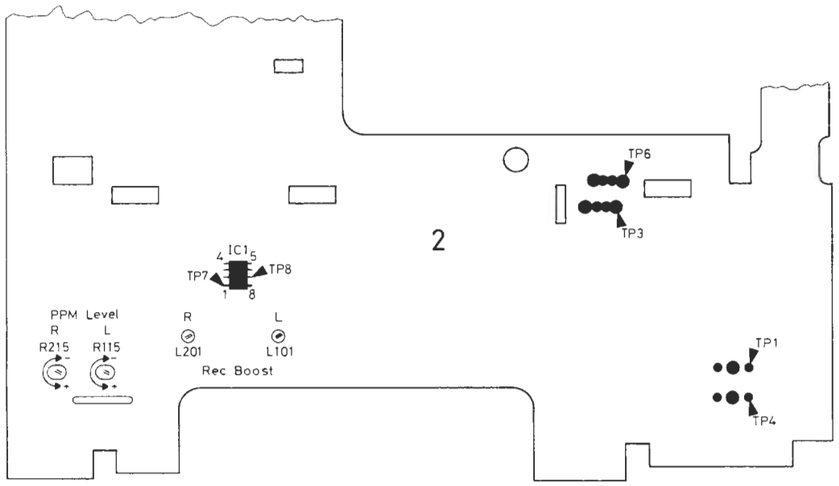
Load play-back level tape 6780035.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Adjust $3R216_{C2}$ ($3R116_{C2}$) until a reading of 725 mV is obtained in 2TP3 (2TP6).

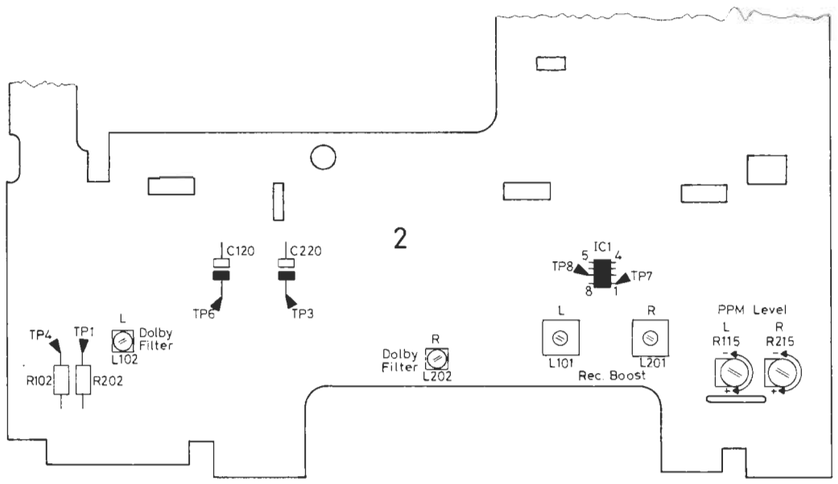
Record Boost

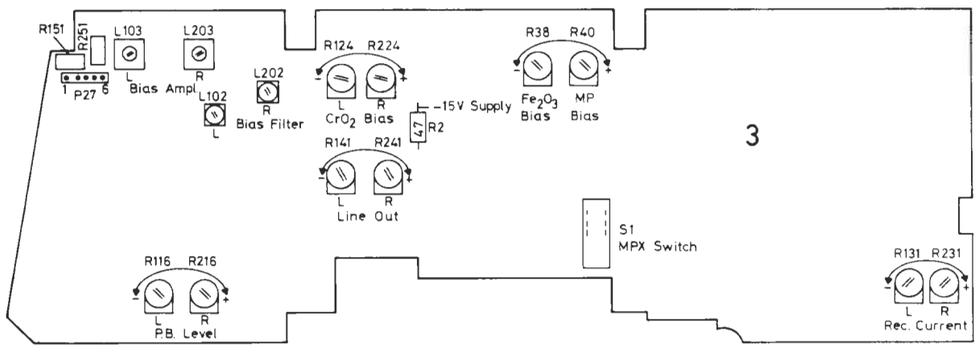
This adjustment must be very accurate.
Load CrO_2 tape.
Connect a tone generator to the AMPLIFIER input and set it to generate 333 Hz and approx. 30 mV.
Connect AF voltmeter to $2TP7_{D6}$ ($2TP8_{D5}$).
Activate record pause.
Adjust the record potentiometers until a reading of 100 mV is obtained in 2TP7 (2TP8).
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Take a reading of the voltage in 2TP3 (2TP6) and write it down.
Change the tone generator frequency to 19 kHz.
Adjust the record potentiometers in such a way that the voltage in 2TP3 (2TP6) is exactly the same at 19 kHz as at 333 Hz.
Connect an AF voltmeter to $2TP7_{D6}$ ($2TP8_{D5}$).
Adjust with $2L201_{D6}$ ($2L101_{D5}$) until 1.4 V is measured in 2TP7 (2TP8) (corresponds to +23 dB at 19 kHz in relation to 333 Hz.

PPM

Set the tone generator to generate 333 Hz and approx. 300 mV.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Activate record pause.
Adjust the record potentiometers until 725 mV is measured in 2TP3 (2TP6).
Adjust $2R215_{E7}$ ($2R115_{E7}$) until the +2 dB LED is just glowing.





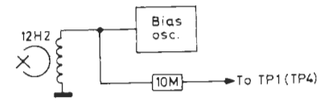


Bias and Record Current

Set the record potentiometers in mid-position.
Set $3R224_{A4}$ ($3R124_{A3}$) and $3R231_{C8}$ ($3R131_{C8}$) in mid-position.

Dolby Filter

Fit a 10 Mohm resistor from erase head to the Dolby input $2TP1_{E1}$ ($2TP4_{E1}$).



Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Activate Record (without AF signal applied).
Adjust $2L202_{E4}$ ($2L102_{D2}$) to minimum voltage as measured in 2TP3 (2TP6).
Remove 10 Mohm resistor.

Bias Amplifier and Filter

Measure with DC voltmeter on pin 6 of P27 (pin 1 of P27) ($3R251_{A1}$ ($3R151_{A1}$) in relation to -15V supply.
Activate Record (with no AF signal applied).
Adjust $3L203_{A2}$ ($3L103_{A2}$) and $3L202_{A3}$ ($3L102_{A2}$) to minimum deflection on the DC voltmeter.

Record Current

Load CrO_2 standard test tape 6780066.
Connect tone generator to AMPLIFIER input and adjust to generate 333 Hz and approx. 300 mV.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Activate Record pause.
Adjust the Record potentiometers until a reading of 200 mV is obtained in 2TP3 (2TP6).
While recording and playing back respectively, adjust $3R231_{C8}$ ($3R131_{C8}$) until a reading of 200 mV is obtained during Record as well as Play-back.

CrO_2 Bias

Load CrO_2 standard test tape 6780066.
Set tone generator to generate 333 Hz and approx. 30 mV.
Connect AF voltmeter to $2TP3_{D3}$ ($2TP6_{D2}$).
Set Record potentiometers until a reading of approx. 20 mV is obtained in 2TP3 (2TP6).
While recording and playing back respectively at 333 Hz and at 15 kHz, adjust $3R224_{A4}$ ($3R124_{A3}$) until the level at 15 kHz is 1 dB higher than at 333 Hz.
(Less bias will result in treble boost. More bias will result in treble cut).
Check Record current.

Fe_2O_3 Bias

CrO_2 bias must be adjusted, and tone generator and record potentiometers must have the same settings as for CrO_2 bias.
Load Fe_2O_3 standard test tape 6780067.
While recording and playing back respectively, adjust $3R38_{A5}$ until the level at 15 kHz is 1 dB higher than the level at 333 Hz measured with the AF voltmeter in 2TP3.

MP Bias

CrO_2 bias must be adjusted, and tone generator and record potentiometers must have the same settings as for CrO_2 bias.
Load MP test tape 6780059.
Activate MP button (if there is no hole for METAL sensor at the back edge of the cassette).

While recording and playing back respectively 333 Hz and 15 kHz, adjust $3R40_{A5}$ until the level at 15 kHz is 1 dB higher than the level at 333 Hz measured with the AF voltmeter in 2TP3.

Bias Control

It is possible to check the bias adjustment by measuring the distortion of the 3rd harmonic of 333 Hz (K_3 distortion). The measurement can be made with the test instrument DM1 (Bang & Olufsen). The K_3 distortion must be measured with DM1 connected to the AMPLIFIER input.
Make the measurements with the standard test tapes mentioned under Bias Adjustments, and with the Record potentiometers driven to 725 mV as measured with AF voltmeter in 2TP3 (2TP6).
K_3 must be less than 2% for all three types of tapes.

ELECTRICAL DESCRIPTION
Beocord 8002

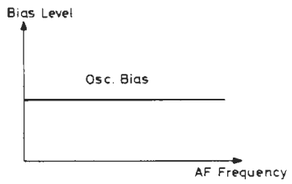
Since Beocord 8002 is a further development of Beocord 8000, only new developed circuits will be dealt with in this description.

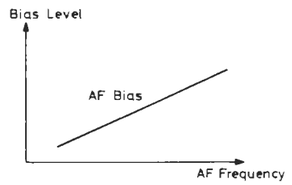
Dolby HX Professional

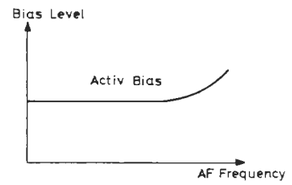
Dolby HX Professional is a system which Bang & Olufsen have developed, partly in co-operation with the Dolby Laboratories; HX stands for **H**eadroom **E**xtension.
It is the objective of the system by means of an active bias regulation to get a **constant** active bias during the recording and thereby achieve a generally better utilization of the tape properties such as Max. Output Level (MOL) of the tape (MOL is an indication of how powerfully a tape can be recorded before saturation occurs).

Active Bias

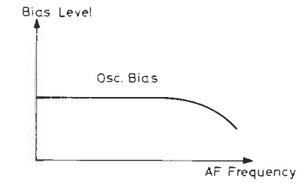
In a conventional cassette recorder the bias is a high-frequency voltage with a constant amplitude and which is mixed into thet AF signal to be recorded on the tape.
However, powerful treble tones in an AF signal will be perceived as bias of the tape and consequently added to the bias which is supplemented from the oscillator. The total effect is called active bias. An increase of the active bias value relative to the adjusted value will result in a deterioration of Most Output Level of high tones and in wrong bias for low tones.
The bias principle of a conventional cassette tape recorder is shown in below three diagrams.

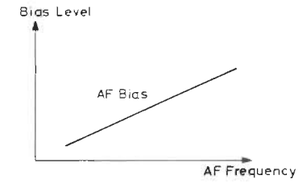


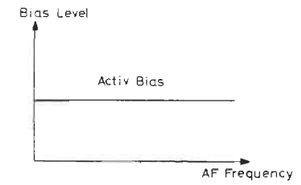




The HX Professional system controls the oscillator bias current in relation to the frequency and level of the AF signal (individually for RH and LH channels) to that the active bias value remains constant on the adjusted level irrespective of what levels and frequencies are present in the AF signal (see the three principal diagrams below).

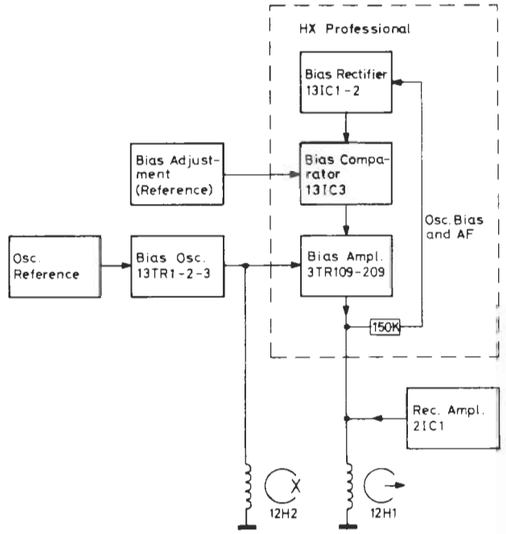




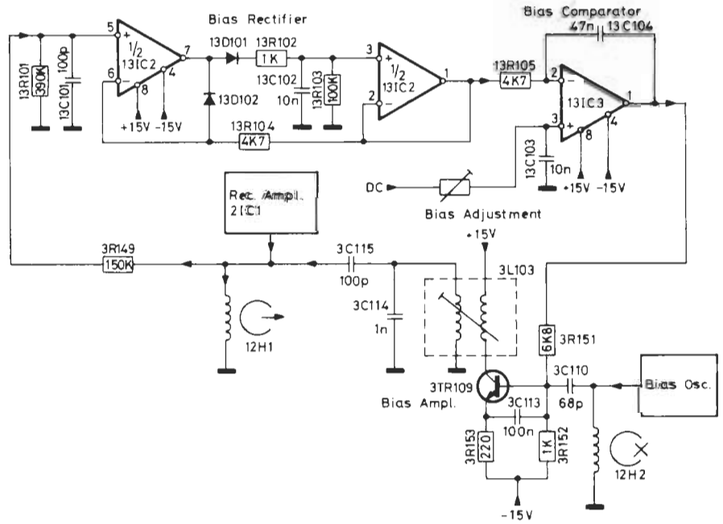


HX Professional results in an improved Max. Output Level at 10 kHz at approx. 5 dB for Fe_2O_3 and CrO_2 and 3-4 dB for MP.

Block Diagram for Acitve Bias



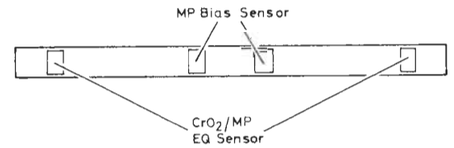
The tape head provides a signal which is a mixture of oscillator bias and AF signal.
This signal is applied to a frequency-dependent rectifier which rectifies the mixed signal with the result that a varying DC voltage is obtained which is an indication of the active bias level (the DC variations are so small that they cannot be measured).
The circuits are in negative feedback which all the time attempts to maintain the active bias at constant level.



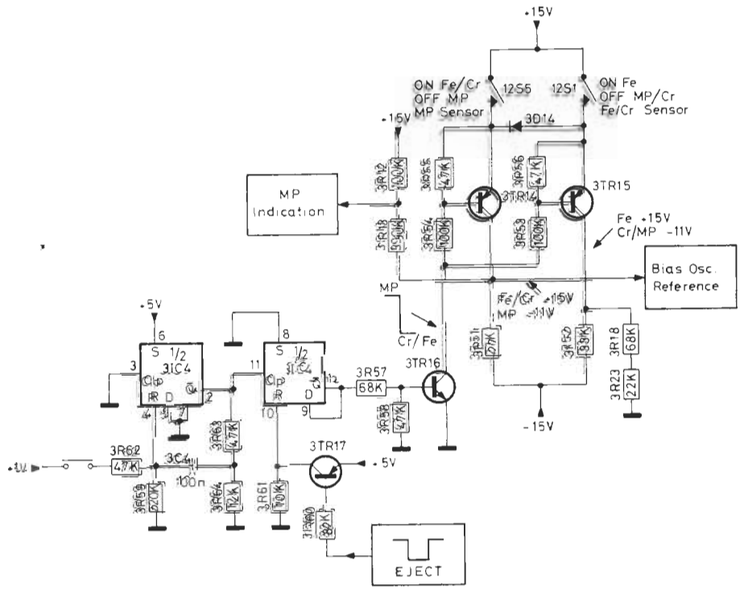
The varying DC is applied to a comparator (13IC3, pin 2) the reference (13IC3, pin 3) of which is a DC voltage which is determined by the bias adjustment. If the level on pin 2 exceeds that on pin 3 of the comparator, the level difference between the two pins becomes substantially amplified and inverted with the result that a higher negative voltage is applied to the base of 3TR109 via 3R151. This negative-going voltage determines the amplification in 3TR109 and thus how much oscillator bias is to be applied to the tape head. In other words, the circuit will all the time be adjusting itself into the same DC level as the reference level from the bias adjustment. 3L103 step-up transformer will transform the voltage wave on the collector of 3TR109 to the amplitude required.

Switch between MP and Fe_2O_3/CrO_2

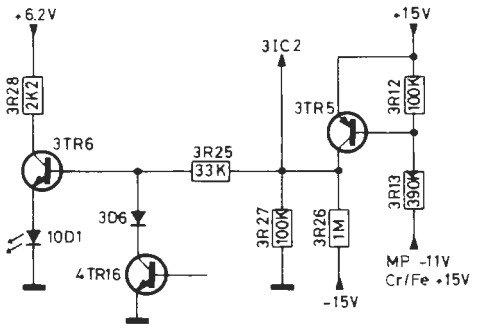
MP Cassette



Beocord 8002 has an extra switch at the back edge of the cassette tray for automatic switching of bias and recording current between MP and Fe_2O_3/CrO_2 (play-back equalizing is the same for MP as for CrO_2).
Not all MP cassettes, however, are provided with holes at the rear edge for automatic switching. When using that type of cassette, bias and record current can be forced into the MP mode by means of the MP ON/OFF button.
When an MP cassette with no holes for MP bias sensor has been inserted:
Prior to the cassette loading EJECT has been activated and this has resulted in a short-duration low level on the base of 3TR17, and this low level becomes inverted to high on pin 10 of 3IC4 with the result that pin 12 also goes high and remains high. 3TR16 will go ON, and since 12S5 in ON, the collector of 3TR14 will be +15 V and thus in Cr/Fe mode.
When activating the MP ON/OFF button a high level is applied to pin 4 of 3IC4, and pin 2 will go high and pin 12 go low. 3TR16 and thus 3TR14 will go OFF, and the voltage on the collector of the 3TR14 will be changed to -11 V corresponding to MP mode.
After EJECT and loading of a cassette with holes for MP bias sensor, 3TR16 will again be ON, but now both switches are OFF, and the voltage on the collector of 3TR14 will be -11 V. 3R63 and 3C4 are a positive feedback of the positive-going level from pin 2 to pin 4 which eliminates »bouncing« from the switch.
The circuits are adjusted to Fe_2O_3 tapes with 3TR15 and 12S1 ON.

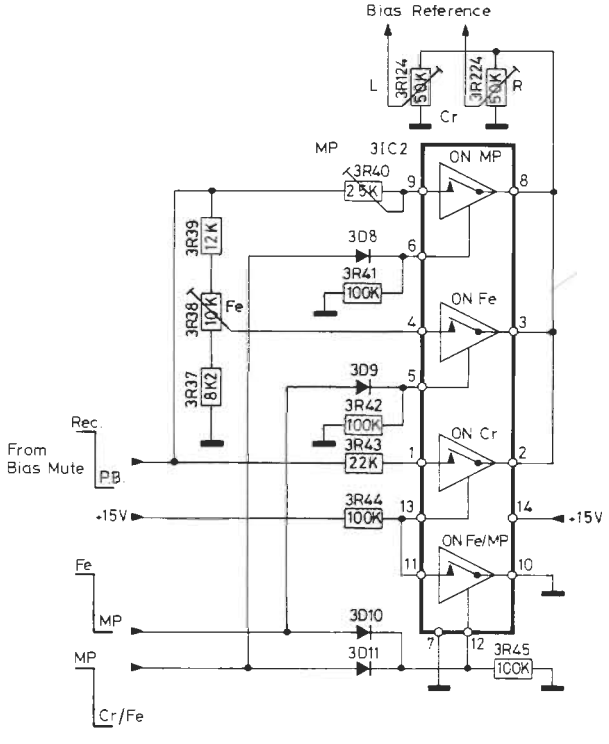


MP Indicator



In MP mode 3TR5 will go ON, its collector will become positive, 3TR6 will go ON and the MP indicator 10D1 will glow.
With no cassette in the cassette tray both 12S5 and 12S1 are OFF, and -11 V will be applied to 3R13, and as this would result in 10D1 glowing, 3D6 has been introduced.
With an empty cassette tray 4TR16 in ON, and the voltage on the base of 3TR6 is conducted to chassis via 3D6 and 4TR16.

HX Reference

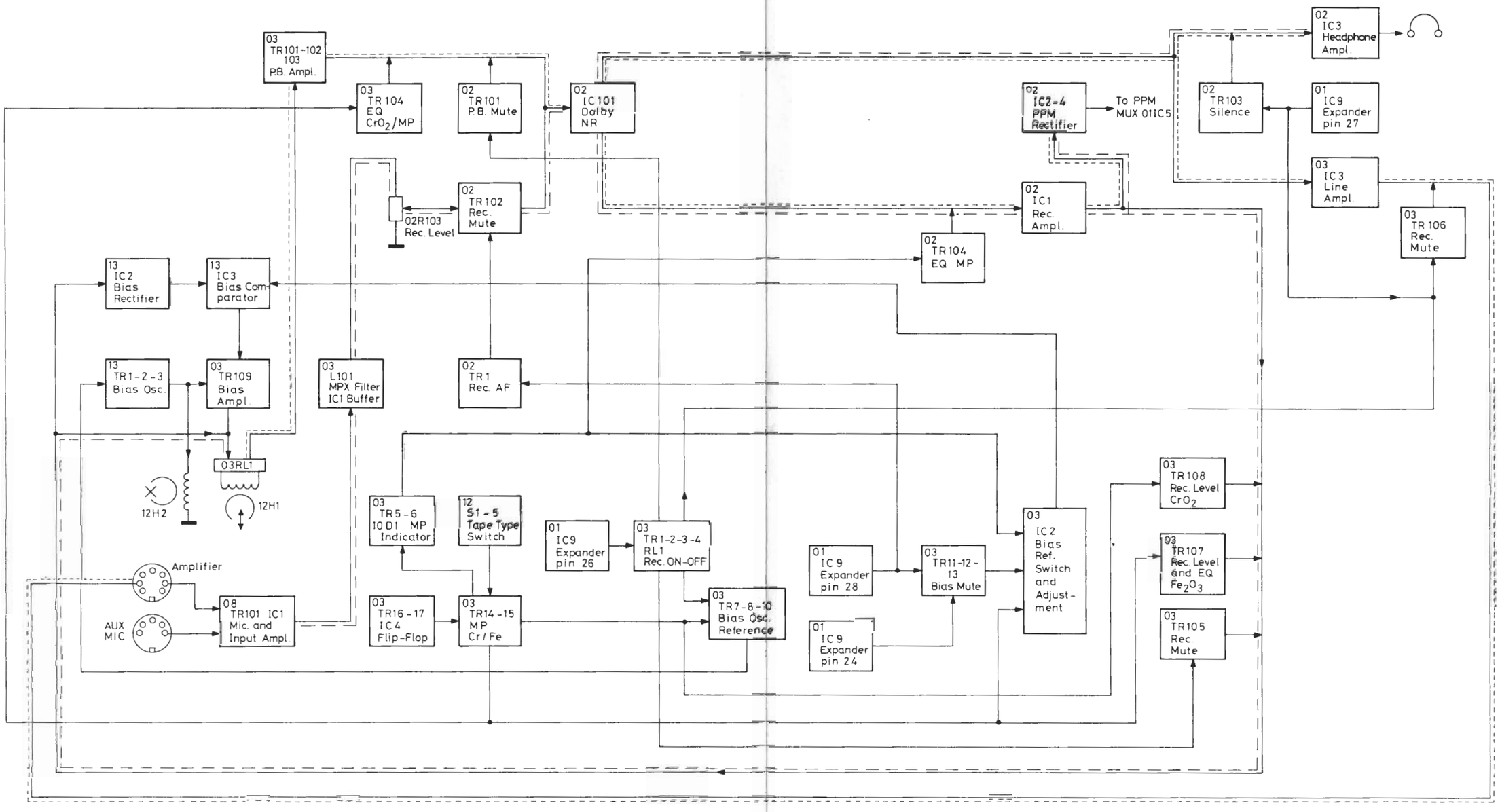


The bias reference voltages for the three types of tapes are conveyed to the HX system via 3IC2 which contains four switch sections. The references are adjusted by first to adjust CrO_2 and separately for RH and LH channels (3R124 and 3R224), so that any channel difference is equalized at the CrO_2 adjustment. The adjustment for MP and Fe_2O_3 is common for RH and LH channels (MP 3R40/Fe_2O_3 3R38).

Block Diagram for AF Circuit

— — — — Signal path record

- - - - - - - - Signal path play back


03 TR101-102 103 P.B. Ampl.
03 TR104 EQ CrO_2/MP
02 TR101 P.B. Mute
02 IC101 Dolby NR
02 IC2-4 PPM Rectifier
To PPM MUX 01IC5
02 IC3 Headphone Ampl.
02 TR103 Silence
01 IC9 Expander pin 27
02 TR102 Rec. Mute
02R103 Rec. Level
02 IC1 Rec. Ampl.
03 IC3 Line Ampl.
03 TR106 Rec. Mute
02 TR104 EQ MP
13 IC2 Bias Rectifier
13 IC3 Bias Comparator
13 TR1-2-3 Bias Osc.
03 TR109 Bias Ampl.
03 L101 MPX Filter IC1 Buffer
02 TR1 Rec. AF
03RL1
12H2
12H1
03 TR5-6 10 D1 MP Indicator
12 S1-5 Tape Type Switch
01 IC9 Expander pin 26
03 TR1-2-3-4 RL1 Rec. ON-OFF
03 TR7-8-10 Bias Osc. Reference
01 IC9 Expander pin 28
01 IC9 Expander pin 24
03 TR11-12-13 Bias Mute
03 IC2 Bias Ref. Switch and Adjust-ment
03 TR108 Rec. Level CrO_2
03 TR107 Rec. Level and EQ Fe_2O_3
03 TR105 Rec. Mute
Amplifier
AUX MIC
08 TR101 IC1 Mic. and Input Ampl
03 TR16-17 IC4 Flip-Flop
03 TR14-15 MP Cr/Fe

TECHNICAL SPECIFICATIONS
Beocord 6000

Compact cassette	C46-C60-C90-C120
Tape head	Sendust
Noise reduction	Dolby B
Tape switch	Aut. ferro/chrom/manual metal
Wow and flutter DIN	<±0.1%
Wow and flutter WRMS	<0.045%
Speed deviation	<±1%
Fast forward and rewind C60	70 sec.
Frequency range chrom/metal/ferro	30-16,000 Hz ±2.5 dB (with MPX filter)
Signal-to-noise ratio metal Dolby NR	>68 dB
Signal-to-noise ratio chrom Dolby NR	>66 dB
Signal-to-noise ratio ferro Dolby NR	>64 dB
Signal-to-noise ratio metal	>60 dB
Signal-to-noise ratio chrom	>58 dB
Signal-to-noise ratio ferro	>56 dB
Drivability metal	<8 dB
Drivability chrom	<15 dB
Distortion metal	<2.5%
Channel separation	>35 dB
Erasure	>70 dB
Erase frequency	96 kHz
Radio input DIN-LINE	1 mV/10 kohms - 40 mV/470 kohms
Microphone input	0.1 mV/3 kohms
AUX input	100 mV/1.2 Mohms
Radio output adjustable	800 mV (500-2000 mV)/2 kohms
Headphones	Max. 5 V/56 ohms
Power consumption	Max. 50 W
Dimensions W x H x D	53 x 13 x 30 cm
Weight	7.5 kg

Power Supply

Type 4831	114V
Type 4832	120V
Type 4833	127V
Type 4834	220V
Type 4835	240V
Type 4836	240V
Type 4837	105V
Frequency	50-60 Hz

Subject to change without notice

Beocord 8002

Compact cassette	C46-C60-C90-C120
Tape head	Sendust
Noise reduction	Dolby B
Tape switch	Aut. ferro/chrom/metal
Wow and flutter DIN	<±0.1%
Wow and flutter WRMS	<0.045%
Speed deviation	<±1%
Fast forward and rewind C60	70 sec.
Frequency range chrom/metal/ferro	20-20,000 Hz ±3 dB
Signal-to-noise ratio metal Dolby NR	>68 dB
Signal-to-noise ratio chrom Dolby NR	>66 dB
Signal-to-noise ratio ferro Dolby NR	>64 dB
Signal-to-noise ratio metal	>60 dB
Signal-to-noise ratio chrom	>58 dB
Signal-to-noise ratio ferro	>56 dB
Drivability metal	>-5 dB
Drivability chrom/ferro	>-8 dB
Distortion metal	<2%
Channel separation	>35 dB
Erasure	>70 dB
Erase frequency	96 kHz
Radio input DIN-LINE	1 mV/10 kohms - 40 mV/470 kohms
Microphone input	0.1 mV/3 kohms
AUX input	100 mV/1.2 Mohms
Radio output adjustable	1000 mV (500-2000 mV)/10 kohms
Headphones	Max. 10 V/56 ohms
Power consumption	Max. 50 W
Dimensions W x H x D	53 x 13 x 30 cm
Weight	7.5 kg

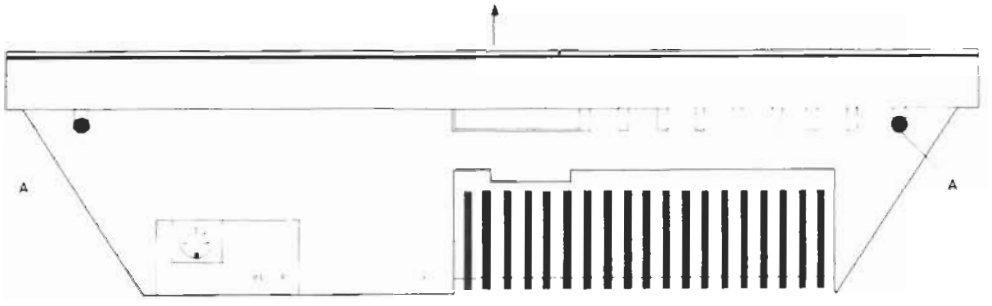
Power Supply

Type 4841	114V
Type 4842	120V
Type 4843	127V
Type 4844	220V
Type 4845	240V
Type 4846	240V
Type 4847	105V
Frequency	50-60 Hz

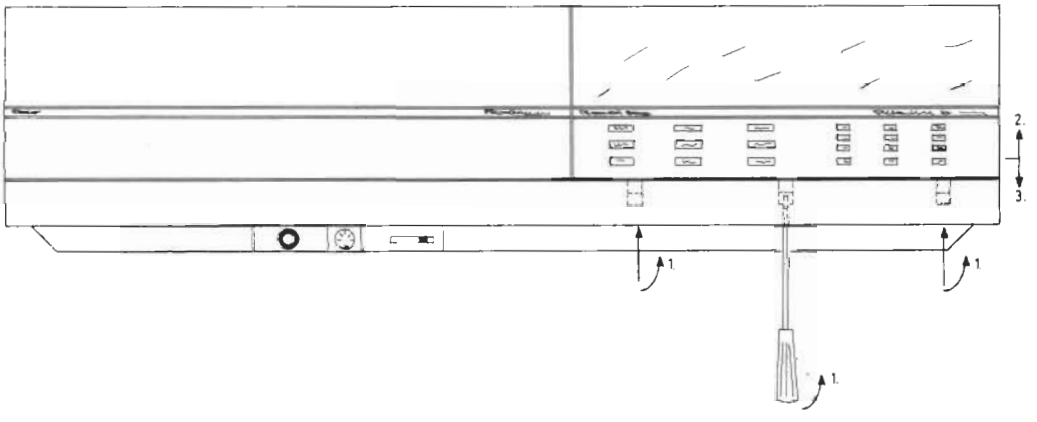
Subject to change without notice

ADSKILLELSE
DISASSEMBLY

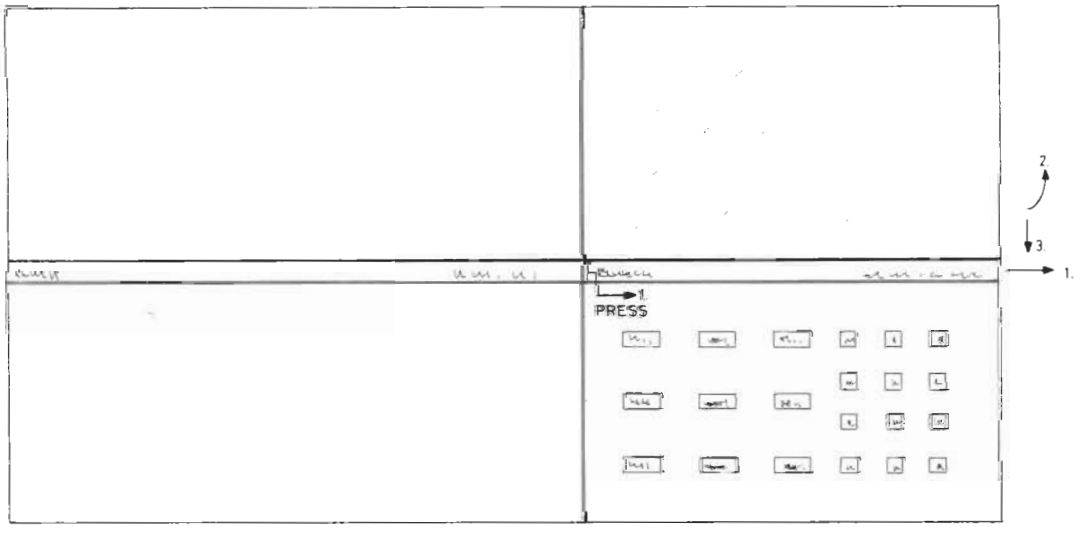
Serviceposition: Skruerne A løsnes
Service position: Loosen screw A



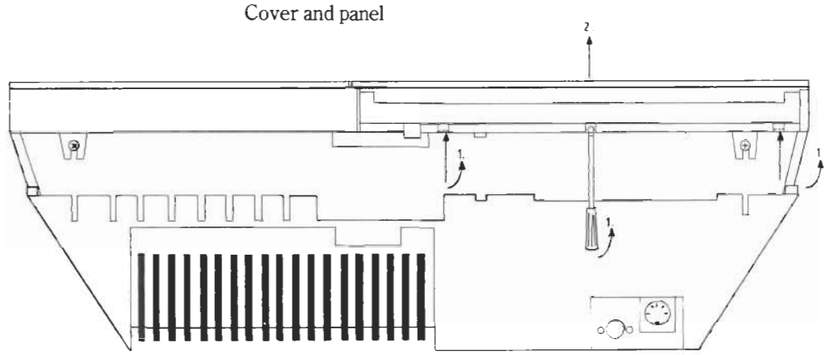
Betjeningspanel
Operating panel



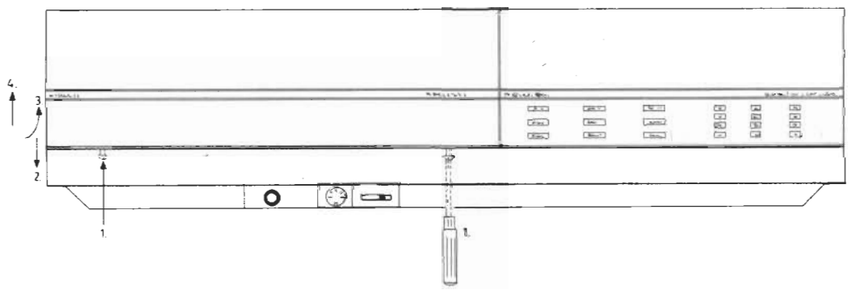
Display dæksel
Cover for display



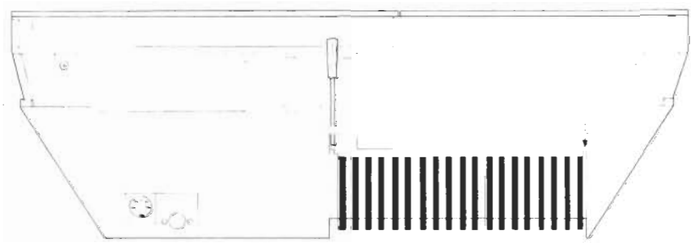
Toppanel og vippelåg
Cover and panel



Aluminiumsdækplade
Aluminium cover



Power enhed
Power unit



INSULATION TEST

Each set **must** be insulation tested after dismantling. The test is to be performed when the set has been re-assembled and is ready for delivery to the customer.

Insulation test for Beocord 6000-8002

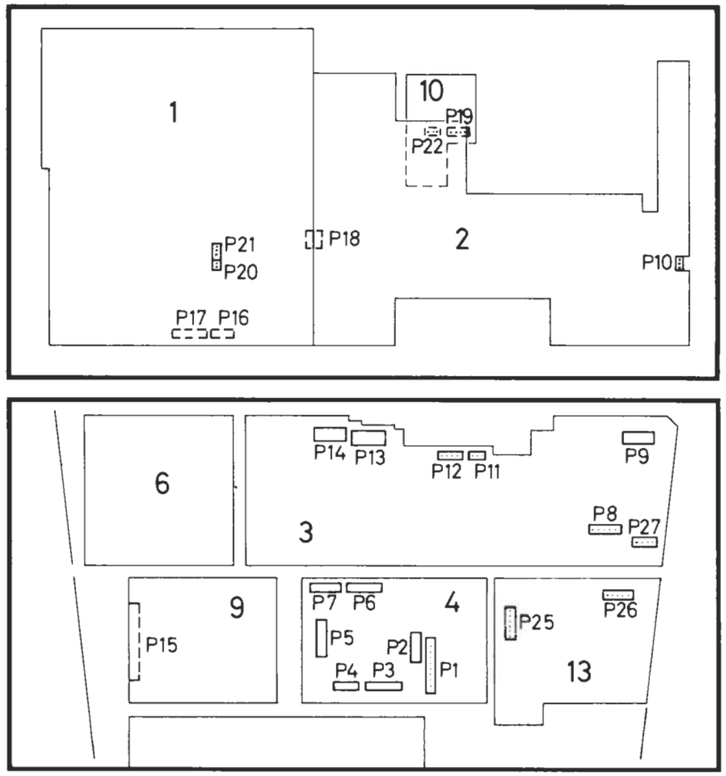
Make the insulation test as follows: – Short-circuit the two plug pins of the mains plug and connect one of the terminals of the insulation tester. Connect the other terminal of the insulation tester to the chassis pin of the headphone socket.

N.B.!
To avoid tuining the set, it is essential that both insulator test terminals are in really good mechanical contact.

Now turn slowly the voltage control of the insulation tester until a voltage of 1.5–2 kV is obtained. Hold it there for 1 second, then turn slowly the voltage down again.

At no point during the testing procedure any flash-overs are permissible.

SERVICE TIPS AND MODIFICATIONS
Plug Survey



Wow frequencies

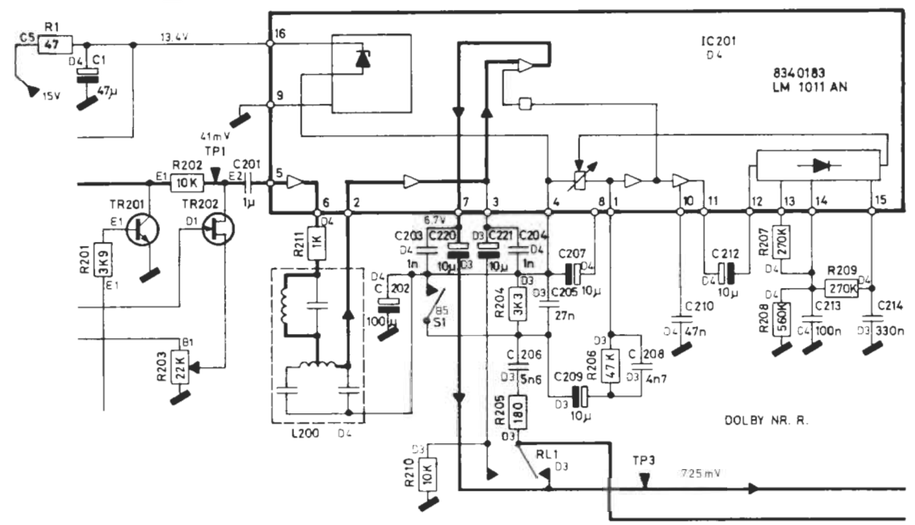
Frequency	Source of Failure	Pos. No.
1,1 Hz	Thrust roller	12049
1,3 Hz	Take-up reel	12044
4,3 Hz	Drive belt	12162
4,5 Hz	Take-up belt	12140
5,2 Hz	Idler wheel	12041
6,0 Hz	Flywheel	12161
11,8 Hz	Cluth	12135
36,5 Hz	Pulley	12101

Dolby IC

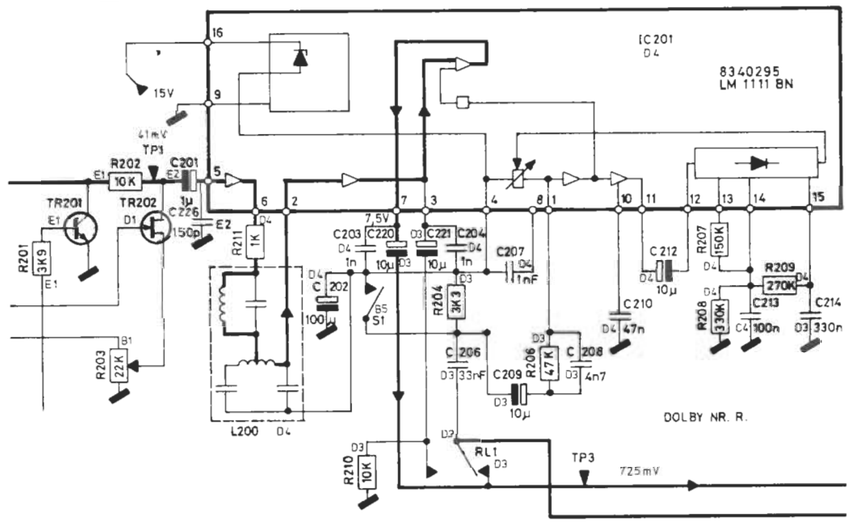
In the current production of Beocord 6000 the Dolby IC has been modified to another type.
Old type: LM1011AN 8340183
New type: LM1111BN 8340295

Diagrams of the two types are shown in below diagram sections. The two types of ICs are not compatible.

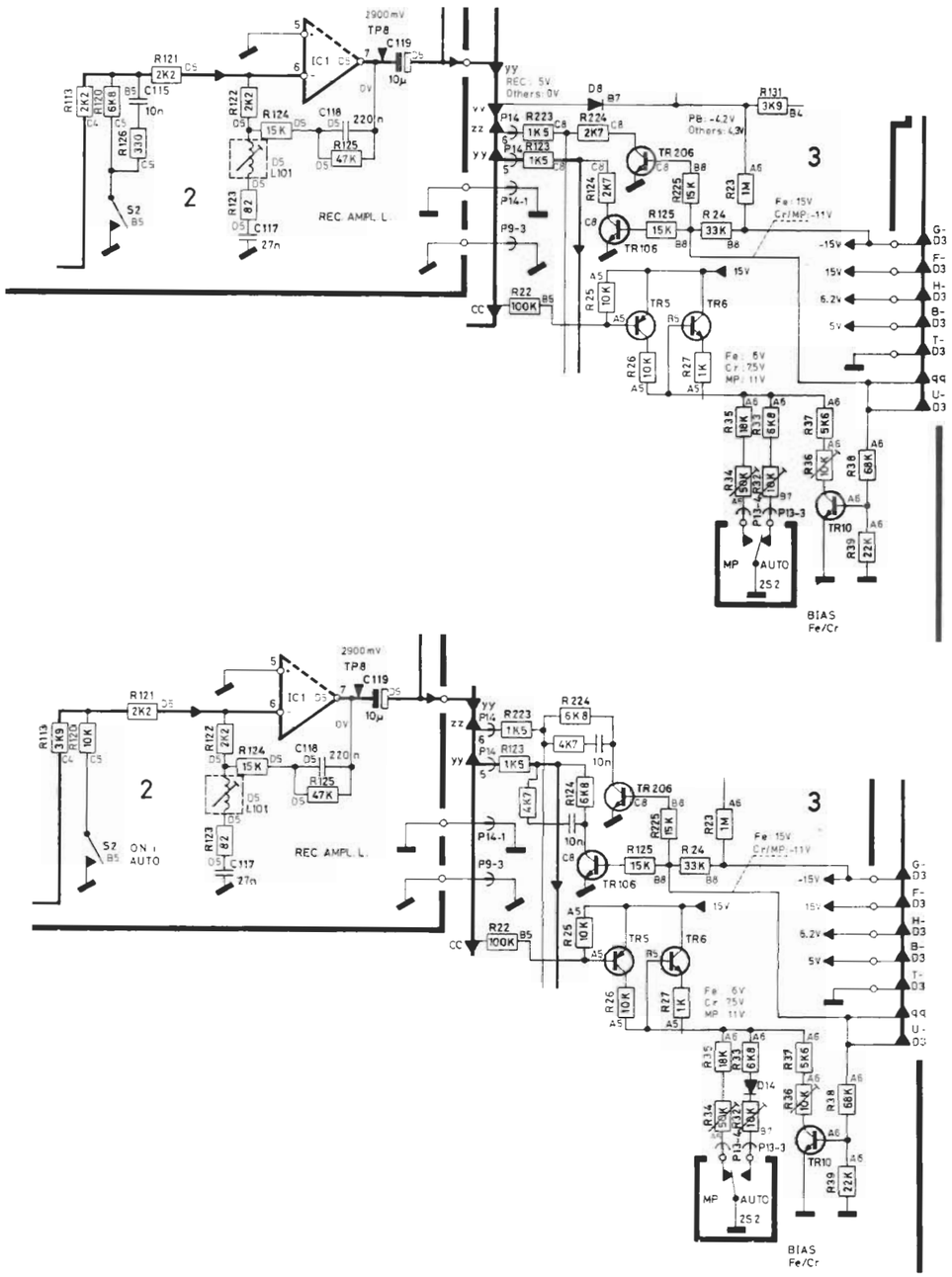
8004220 -2

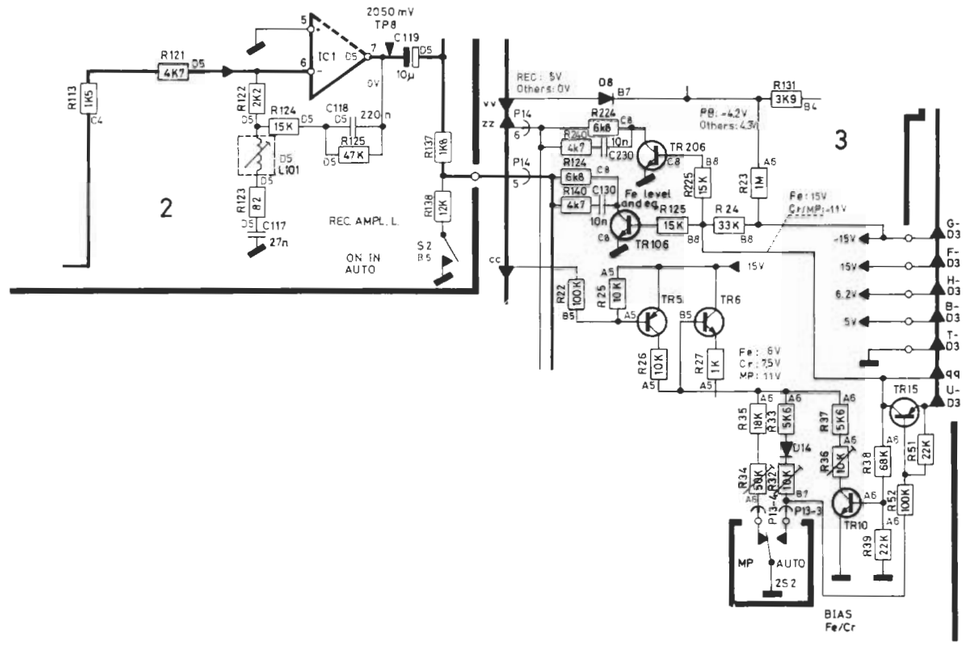


8004262 -2



In the production of Beocord 6000 the record circuits will be changed twice.
The different versions are shown in the below diagram.





END TEST

By carrying out the following procedure a test check-out of all the functions of the set is performed

	OPERATION			FEED-BACK	
	Comments	**Enter**	**Indicator**	**Display**	**Tape Transport**
1	Connect to Beomaster and to mains	X	X	□□:□1 and □□·□1	X
2		0 → 9 CE GO	X	Follows entry □□:□1 and □□·□1 ⊐□·□□and ⊏□·□□	X
3		TIME SET TIMER START TIMER STOP	X	Time from connection e.g. □□:□2 and □□·□2 □□·□□and ·□□ □□·□□and □□·	X
4	Insert prerecorded tape	<< >> > > STOP > EJECT	X Reading on PPM X	Flashes ⊏⊏·⊏⊏ Flashes ⊐⊐·⊐⊐ Measures tape in real time ⊐□·□□ ⊏□·□1 Flashes twice □□·□□ Actual tape time Measures tape in real time ⊐□·□□ and⊏□·□□	<< >> > X Stop > Stop and tape ejects
5	Insert tape for recording from the start of the tape (Not a MP cassette)	REC OPEN RECORD Adjust REC level RECORD STOP (note time for entry) MP ON-OFF MP ON-OFF	REC·OPEN Flashes RECORD PPM follows REC level Constant RECORD Flashes RECORD, reading on PPM disappears for approx. 4 secs. MP ON MP ON goes off	⊐□·□□ and⊏□·□□ X Measures tape in real time Measures tape in real time for approx. 4 secs., then shows actual tape time	X > >for approx., 4 secs., then stop

	OPERATION			FEED-BACK	
	Comments	**Enter**	**Indicator**	**Display**	**Tape Transport**
6		RECORD MEMORY + RETURN when first digit shows □ >> MEMORY - STAND BY	Constant RECORD Constant MEMORY Flashes RECORD RECORD goes off, flashes MEMORY MEMORY goes off X	Measures tape in real time X Measures tape in real time shows approx. time for STOP entry, measures for approx. 4 secs., then actual tape time Measures tape in real time to memory point X Only upper point lights	> X <<, >, stop, >, stop >>, stop X X
7	Check of pre-corded tape by listening via headphones and Beomaster. Check of record/replay with and without Dolby by litening via headphones and Beomaster. Check of record/replay with and without MPX filter by listening via headphones.				